

SUPPLEMENT

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Section III.—Gynaecology and Obstetrics.

(Continued.)

THE DIFFERENTIAL SURGICAL TREATMENT OF PROLAPSE OF THE UTERUS.

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WHEN I accepted Dr. Morrison's invitation to read a paper before this Section on the differential surgical treatment of prolapse of the uterus, I fully recognized the controversial possibilities of the subject. The number of different operations described in present-day works on gynaecology for the cure of prolapse is evidence of the widely differing views as to the best methods. It is not part of my purpose to enter into a description of these with their details and variations in technique. The object of this paper is rather to open a way for a discussion of methods which appeal at the present time, and to bring our experience to bear on the question as to what is worth preserving for useful and practical ends; and I should like to say at the outset that if I touch on points well known to you, it is to remind rather than to inform.

Prolapse or descent of the uterus is usually described according to the degree of the descent. In the first place there is a slight lowering of the organ in the vagina with or without a backward displacement and with a varying degree of prolapse of the anterior or posterior vaginal wall. In the second place there is a more evident degree of descent as far as but not outside the vulva, with well defined cystocele or rectocele or both (the relaxed vaginal outlet). The third degree comprises the escape of the uterus outside the vulva, with external prolapse and eversion of the vaginal walls (*procidentia*). This is the broad outline of the clinical picture: other structural deficiencies may coexist.

Two points should be emphasized. The first is that as practically every case of descent of the uterus is associated in a greater or less degree with prolapse of either the anterior or posterior vaginal wall or both, namely a cystocele or rectocele, no operation for the cure of uterine prolapse can be effective which does not at the same time correct these vaginal prolapses. The second point is that the convenient divisions of descent into three types, according to the degree, does not rigidly define the method of operating.

It is hardly necessary to add that each case must be

treated according to its own requirements. The operation has to be fitted to the disability and not the disability to the operation, and in any case the operation will gain by being reduced to its simplest form.

Coming to the actual operations, we may regard them from two aspects, (i.) those which apply to the child-bearing period during which it is desirable to maintain the possibility of pregnancy, and (ii.) those which apply to the post-climacteric period.

Operation During the Child-Bearing Period.

For the first the object is to restore the uterus to its normal position, to maintain its natural freedom of movement, to repair all injury and strengthen all weakness of the pelvic floor; in other words to restore the conditions for a favourable pregnancy and delivery.

In the first degree of descent, which has followed on child-birth there has been injury to the perineum, more or less stretching and tearing of the *levator ani* muscles, the recto-vaginal and vesico-vaginal fasciae.

Perineorrhaphy with strengthening of the anal sphincter and anterior colporrhaphy are essential in every case. Even with a very small cystocele it is wise to anticipate an increase and to correct it.

The success of a perineorrhaphy consists not only in abolishing the rectocele, but in closing the gap between the separated *levatores* and taking in the anal fascia below. Sutural approximation of the *levatores* is an essential, and however strong and well-bunched a perineum looks and feels at the conclusion of the operation, the weak spot will sooner or later be in evidence if the *levatores* have not been reinforced.

In anterior colporrhaphy especially with a fair sized cystocele, in addition to separating the bladder from the vaginal wall, it should be separated high up from the cervix and sutured to the outlying fibrous tissue.

In a considerable proportion of cases with a moderate degree of descent of the uterus colpo-perineorrhaphy and anterior colporrhaphy will give the uterus back its natural support and preserve its fitness for child-birth.

If there is a tendency to backward displacement, the reconstruction of the pelvic floor will in most cases correct that tendency. Pregnancy time and again has corrected the slightly backward-deviating uterus. We are inclined, I think, to take an unduly pessimistic view of retro-deviation in pregnancy. When I have any doubt about the matter I make a small abdominal incision after completing the vaginal work and plicate the round ligaments, folding each on itself, one loop with just sufficient shortening to bring the uterus forward.

After a long experience of the Alexander-Adams operation I prefer the median incision. The surgeon knows better thereby what has to be done and not infrequently the unexpected is met with inside the abdomen.

In the second degree, repair of the pelvic floor by the preceding methods needs to be supplemented by measures which make good any loss of pull on the round and broad ligaments.

There is a choice of methods for dealing with the round ligaments. I limit mine to two. If they are firm and allow of a fair length of shortening (two and a half centimetres or more) anterior plication will give a good forward pull; one fold of each ligament is fastened to the anterior surface of the uterus and the two ends of the free loops are sutured together thus combining a forward and a suspensory pull.

My other choice is the Gilliam operation. Its simplicity has appealed to all of us, but I have never quite satisfied myself that the pregnant uterus under the altered direction of the pull of the implanted round ligaments could be relied on to maintain the normal anteposition which makes for normal delivery. So far as I have been able to trace patients who have subsequently become pregnant, occipito-posterior positions seem to have occurred in undue proportion.

In the third degree of descent (*procidentia*), where the broad ligaments are nearly always very relaxed from the long existing drag, an excellent result is obtained by taking in the slack of each broad ligament, folding it posteriorly to the posterior surface of the uterus.

The operation is very simple, the chief point to observe being the avoidance of the ovarian vessels below which the sutures into the ligaments make their initial pass. Along with this a simple single surface-to-surface fold of the round ligament completes a measure which gives both elevation and direction to the uterus.

Operation During the Post-Climacteric Period.

In a large number of cases especially in elderly women the cystocele and rectocele often constitute the more important lesion. The uterus may have become atrophied. On the other hand we are all familiar with the long standing *procidentia*, the uterus hanging outside the vulva like a myoma, often ulcerated and carrying with it the ballooned anterior and posterior vaginal walls.

This condition opens up the question of hysterectomy; I do not often find it necessary. In the case of a myomatous uterus or a degenerate condition generally it must be done, but it should be remembered that the large swollen protruding organ is more often than not the result of venous and lymphatic engorgement, a mechanical stasis with oedema. If it is replaced within the vagina (an anæsthetic being seldom required), and kept at rest for a week or two and mild hot antiseptic douches given, a surprising diminution in the size of the organ will take place. The vaginal work can then be proceeded with, a laceration repaired or the cervix amputated and an intra-abdominal fixation can be done. I feel on sure ground in this matter after having operated on many elderly women.

As illustrating and confirming this statement as to the effect of venous engorgement on a prolapsed uterus, I

should like to mention an unusual experience I had at the Women's Hospital, Melbourne, many years ago. A woman in her sixty-eighth year was brought into my ward with a fluid abdominal tumour with a girth of one hundred and twenty-seven centimetres at the umbilical level. As she rested in bed the uterus lay outside the vulva literally between her thighs, like an immense polyp, larger than a cricket ball, obviously impossible of replacement within the vagina. I had intended after emptying the abdomen to do vaginal hysterectomy and to close up the vagina. At the end of an hour I had removed a monolocular ovarian cyst with general adhesions, and the hysterectomy was postponed to a more favourable occasion. Back in bed the uterus was supported on a pillow with antiseptic moist gauze. Some ten days later the tumour had disappeared in dramatic fashion. Gradually diminishing it had crept back into the vagina. Whether the increased intra-abdominal pressure of ten litres of fluid had brought about the *procidentia* I am not prepared to say, but the evicted organ had no chance of return. The pressure once removed, the physiological factor came to the rescue. When I made a vaginal examination, only a small atrophied uterus could be felt nor at the end of a month could any tumour be made out bimanually. The patient declined further operation; as a matter of fact there was not a very relaxed outlet and two years afterwards I heard that she was suffering no inconvenience. The lesson was not lost on me; the incident certainly modified my views on the question of hysterectomy.

The advantage of preserving the fundus and part of the cervix is a real one. The support to the para-cervical tissues and the vesico-uterine fold is maintained and can be utilized when the abdomen is opened to supplement the vaginal work.

The application of this is seen in suturing the divided cords of the broad ligaments to the cervical stump when performing supra-vaginal hysterectomy.

Unless some chronically enlarged or degenerate prolapsed uterus makes hysterectomy imperative, my practice has been to do a wide anterior and posterior colporrhaphy and perineorrhaphy supplementing it with either a Gilliam operation or a ventro-fixation. In the event of a supra-vaginal hysterectomy the cervical stump is sutured to the ends of the broad ligaments. During the past ten years I have not often done ventro-fixation; the last occasion was three years ago on an old lady of eighty-five with a bad *procidentia*. This was reduced to a minimum with replacement and douches before the operation was performed. It must be remembered that the vaginal and recto-vaginal tissues do not promise satisfactory union in these very old subjects. Age and the fitness of the patient for operation have to be carefully considered, but some cases are so pitiable and hopeless, as was this old lady's case, that an operation done with no loss of time is a reasonable proposition.

In this short summary of my point of view of the subject it will be noticed that I prefer the abdominal route for such measures as shortening the round or the broad ligaments.

To open the abdomen is not necessarily to take the line of least resistance and after all one's own experience is

the best guide. Nor do I favour severing ligaments in place of folding them; a folded ligament gains in strength.

Ventro-suspension is an operation which in my opinion can be well discarded. It is inadmissible in the child-bearing period. It has served its purpose; we have learned something from it. Ventro-fixation has a useful if limited application in the case of old subjects.

Gilliam's operation with modifications adapted to circumstances may be well retained. The objection that it may prove a trap for the bowel has a certain basis of truth.

Finally there will always be cases where operation of any kind is either refused or contra-indicated. Here the pessary enters its own domain. As a curative agent it never can be seriously regarded in competition with operation and granting it a measure of temporary utility, I venture to say it has never cured a long standing prolapse or a vaginocoele.

In the course of more than thirty years' hospital experience I have tried many methods. Both by folding and division I have shortened and transplanted round and broad ligaments after my own fashion and the fashions of others, and I have anchored the uterus in certain ways which I would not now sanction.

During a visit to the old country and the continent in 1910, I could have counted at least ten different operations that were being done in the various hospitals for prolapse of the uterus and its attendant abnormalities.

The conclusion that I came to was that they could not all be right and that they could not all be wrong.

THE TOXAEMIAS OF PREGNANCY WITH AN ANALYSIS OF 158 CASES OF ECLAMPSIA.

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THE Committee of our Section at this the first session of the Australasian Medical Congress (British Medical Association) under its revised constitution is to be congratulated upon the selection of the toxæmias of pregnancy as one of the main subjects for our consideration and discussion. Firstly, because under the term toxæmias of pregnancy are included a number of morbid conditions which, taken as a whole, form the commonest complications of pregnancy. Secondly, because the toxæmias of pregnancy cause between 18% and 20% of the maternal mortality during child-birth and the Commonwealth statistics show that this percentage is increasing and not decreasing. Thirdly, because the toxæmias of pregnancy have received comparatively little attention at previous medical congresses in Australasia, the most important paper that I have been able to discover being that of Dr. R. H. Morrison on eclampsia at the 1911 Congress in Sydney.

Personally I have to thank the Committee for the honour they have conferred upon me in asking me to open the discussion on this important subject. It is impossible in the short space of time allowed for an opening paper to do more than touch briefly on various points in connexion with the subject for discussion, therefore I

beg you to excuse me if my remarks on the vomiting of pregnancy, accidental hæmorrhage and albuminuria of pregnancy appear to be too brief. Most of my remarks will be confined to eclampsia and more especially to an analysis of the histories of one hundred and fifty-eight women treated for eclampsia at the Royal Hospital for Women, Sydney.

Vomiting of Pregnancy.

The first in order of occurrence of the toxæmias and the commonest one, especially in its milder forms, occurs in about 50% of pregnancies. This is usually due to a temporary disturbance of a physiological balance. In the great majority of cases it rights itself with or without simple treatment, but in the minority of cases the condition persists and becomes more severe and then comes under the heading of *hyperemesis gravidarum*.

Within the last few years several investigators have recorded very interesting results in regard to the treatment of this type of toxæmia by the use of carbo-hydrates. V. J. Harding and P. B. Watson (1) state that the main factors in regard to ætiology and treatment are (i.) the metabolic factor. This the primary factor from the standpoint of ætiology shows itself as a glycogen deficiency in the maternal liver and the carbo-hydrate deprivation caused by persistent vomiting intensifies the symptoms. (ii.) The neurotic factor is given second place in regard to ætiology, but in regard to treatment it may demand a major share of therapeutic attention. (iii.) The intestinal intoxication factor is a well recognized cause, but purgation such as commonly used in the later toxæmias of pregnancy is not the aim of treatment. (iv.) The factor of dehydration in the more severe cases of vomiting of pregnancy has to be taken into account especially in regard to treatment.

These four factors, although it must be admitted that a great deal of more exact knowledge is required, give a reasonable field for treatment and the results so far have been most promising and therapeutic abortion has to be performed but rarely.

There is no doubt that proper ante-natal supervision with early treatment in this type of case gives excellent results. The neglected cases with toxæmia fully developed and severe liver lesions already present will tax the most experienced obstetrician and some unfortunately are beyond recall.

Albuminuria of Pregnancy.

This the common complication of the later months of pregnancy has what the late J. W. Ballantyne has aptly termed distant and near danger signals and fortunately in the majority of cases the distant danger signals are sufficiently obvious to cause the patient to seek advice and treatment.

The response to treatment varies with the cause of the albuminuria. Some patients have pure toxæmic albuminuria, in others the cause is chronic nephritis and there is a further group in which these two main causes are combined.

In the first group the response to treatment is usually rapid; in the second group the response, if any, is slow and in the third group the response varies accordingly as the toxæmia or chronic nephritis preponderates in the causation of the condition. We find more patients be-

longing to the last two groups in the ante-natal beds of an obstetric hospital.

In the great majority of those with albuminuria of pregnancy who do not show response to medical treatment, the indications for the induction of premature labour are unmistakable, but in the minority, when the obstetrician is undecided between induction on the one hand and allowing the pregnancy to continue on the other, chemical pathology appears to be of great service. The renal efficiency tests can diagnose progressive lesions and also those in which permanent damage to the kidneys is to be sought. O. L. V. de Wesselow (2) has found that there is a close correspondence between the height of the blood pressure and the diminution in the power of urea concentration and the blood pressure appears to be a valuable indication of the impairment of this function of the kidney. This close correspondence emphasizes the importance of a blood pressure chart when these patients are being treated.

There are, of course, various types of toxæmia in the later months of pregnancy in which the symptoms and signs point to the fact that other organs are receiving more damage than the kidneys and I would like to emphasize what A. M. Wilson states in regard to what he classifies as the hepatic type of toxæmia, that is the case with persistent vomiting, tachycardia and acetonaemia. Usually these patients have little albumen in the urine, but if they do not respond rapidly to treatment, induc-

tion is urgently indicated. Text-books generally seem to fail to indicate this point. I have seen several fatalities among these patients when the course of the disease did not correspond to the text-book picture of acute yellow atrophy.

Accidental Haemorrhage.

Accidental hæmorrhage has not been definitely accepted as a toxæmic manifestation, although there appears to be little doubt in the minds of the majority of obstetricians that it is toxæmic in origin.

The late Gordon Ley (4) stated that: "Eclampsia, coma, acute yellow atrophy of the liver and accidental hæmorrhage are all of toxæmic origin and must be looked upon as associated conditions bearing the same relationship to albuminuria that the various manifestations of pneumococcal infection do to one another."

The condition of the uterus seen when we have to treat patients with accidental hæmorrhage by Cæsarean section, in my opinion, leaves little doubt that the lesions are similar to those caused by toxæmia in other organs, but usually the interstitial hæmorrhages are more evident owing to the excessive vascularity of the organ.

Gibbon Fitzgibbon (5) states that

"When albumen is found in the urine of a case with any type of accidental hæmorrhage, the necessity of laparotomy as the only treatment must be accepted from the first and the patient moved to suitable surroundings." . . . "The main point in the diagnosis of cases of this sort is

TABLE I.
Details of Fatal Eclampsia.

No.	Age	No. of Previous Pregnancies	Period of Pregnancy	Total N of Fits	Fits in Hospital	Onset of Fits	Time in Hospital (hours)	Bl'd Pressure Millimetres of Mercury	Remarks
1	26	1	28	Nil	Nil	No Fits	26	190	Complete suppression of urine; slight coma; died at end of second stage.
2	38	3	?	3	1	Ante-partum	2½	185	Pulmonary œdema and cerebral hæmorrhage.
3	26	0	40	8	6	Ante and intra-partum	36	150	Pulmonary œdema 26 hours after confinement and 26 hours after last fit.
4	28	2	40	7	Nil	Post-partum	12	150	Pulmonary œdema 12 hours after admission.
5	26	5	34	?	Nil	Ante-partum	2	—	Moribund on admission.
6	22	0	28	24	1	Ante and intra-post-partum	48	—	Pneumonia.
7	32	3	40	4	Nil	Post-partum	7	—	Moribund on admission.
8	39	2	?	10	7	Ante-partum	7½	200	Died during tenth fit.
9	36	5	38	? No	1	Post-partum	72	150	Coma from admission till death.
10	21	0	36	? No	1	Ante-partum	1	—	Moribund on admission.
11	25	1	38	? No	38	Ante-intra and post-partum	24	140	20 fits after delivery; pulmonary œdema.

The first patient had no fits at all; the condition was probably not eclampsia, although it was entered up as such on the hospital chart.

Three patients had no fits after admission.

Four patients had only one fit after admission and only three had more than one fit after admission.

Three patients were moribund on admission.

In five other patients pulmonary lesions seemed to be the cause of death.

the fact that there is considerably greater evidence of shock than can be accounted for by the estimated amount of bleeding and the patient does not respond to treatment although the hæmorrhage is not continuing. The occurrence of intraperitoneal or broad ligament hæmorrhage in these cases produces symptoms of shock early although the actual loss of blood is small.

Fortunately, however, in the majority of cases of accidental hæmorrhage the uterine musculature retains its

figures illustrate the well known fact that in primiparæ eclampsia is much more common and tends to be less severe than in multiparæ. The deaths that occurred, eleven in number, give a mortality rate of 6.96%.

Of these eleven deaths only one, that of a multipara, occurred among the ninety-one patients with mild eclampsia; the other ten deaths, three of primiparæ and seven of multiparæ, occurred among the sixty-seven whose condition was classified as severe.

TABLE II.
Period of Pregnancy in the Four Large Groups and in all Groups combined.

Types of Eclampsia	Weeks of Pregnancy								
	40	38	36	34	32	30	28	24	?
Ante-partum...	4	1	13	9	10	3	2	1	2
Ante and Intra-partum ...	12	7	5	4	2	4	3	1	
Intra-partum ...	14	3	5	1					
Post-partum...	25	5	4	5					2
All Groups Combined	58	19	29	19	12	7	6	2	5

In the ante-partum group of forty-five patients (period not stated in two) the fits occurred in five women after the thirty-sixth week and in thirty-eight before.

In the ante- and intra-partum group of thirty-eight patients (two twin pregnancies) the fits occurred in nineteen women after the thirty-sixth week and in nineteen before.

In the intra-partum group of twenty-three patients, the eclampsia occurred in seventeen after the thirty-sixth week and in six before.

In the post-partum group of thirty-nine patients (period not stated in two; five twin pregnancies) the fits occurred in thirty after the thirty-sixth week and in seven before.

These figures indicate that ante-partum eclampsia tends to occur earlier in pregnancy, the intermediate groups show gradually increasing figures for the later periods of pregnancy and decreasing for the earlier, whilst the post-partum group figures are almost the reverse of the ante-partum group. In five out of seven twin pregnancies the fits were confined to the post-partum period.

powers of contraction and retraction and Cæsarean section is not necessary.

Eclampsia.

The statistics which I wish to bring before you, consist of a consecutive series of one hundred and fifty-eight cases of eclampsia in women treated in the Royal Hospital for Women during a period of seven and a half years from January, 1916, till June, 1923. Of the one hundred and fifty-eight patients one hundred and four were primi-

The deaths reveal the greater severity of eclampsia in multiparæ; there were three deaths among one hundred and four primiparæ and eight deaths among fifty-four multiparæ.

Classifying the patients into groups according to when the fits occurred we find that: in forty-five the fits were *ante-partum* (including two on whom Cæsarean Section was performed before the onset of labour).

In thirty-eight patients the fits were *ante- and intra-*

TABLE III.
Effect on the Infants Arranged in the Four Large Groups.

Type of Eclampsia	Number of Patients	CONDITION OF INFANTS				Delivered by Cæsarean (living)	UNDELIVERED INFANTS	
		Living	Neo-natal Deaths	Stillborn	Macerated		Dead	Living
Ante-partum	45	14	3	6	14	2	4	2
Ante and Intra-partum	38	19	0	17	2	0	0	0
Intra-partum	23	17	0	4	2	0	0	0
Post-partum	27	35	0	2	0	0	0	0

paræ and fifty-four multiparæ. Classified in the same way as that adopted by the British Congress of Obstetrics and Gynæcology in June, 1922 (6) we find that of the primiparæ sixty had mild eclampsia and forty had severe eclampsia, whereas of the multiparæ the condition was mild in twenty-seven and severe in twenty-seven. These

partum (including five with *ante-partum* eclampsia in whom labour was induced, and one patient without fits).

In seven patients the fits were *ante-, intra- and post-*

In one patient the fits were *ante- and post-partum*

(labour started twenty-four hours after the fits ceased; there was one fit *post-partum*).

TABLE IV.

Effect on the Infants Arranged According to the Various Periods of Pregnancy.

Condition of Infant	Duration of Pregnancy in Weeks							
	40	38	36	34	32	30	28	24
Macerated	0	0	2	9	5	0	1	1
Neo-natal Deaths	0	0	0	0	2	1	0	0
Stillborn	13	1	4	4	1	4	3	1
Living	45	18	21	5	5	1	1	0
Totals	58	19	27	18	13	6	5	2

Table III. shows clearly that the effect on the infants is worst in *ante-partum* eclampsia and that the macerated foetus is the largest factor in the mortality in this group.

The effect on the infants is better in the *ante*- and *intra-partum* group and the stillborn infant is the cause of most of the mortality.

In *intra-partum* eclampsia there is a decided improvement and in *post-partum* eclampsia the best results are noted.

Table IV. indicates the great effect that prematurity has on the condition of the infants. One hundred and four women confined during the last six weeks of pregnancy gave birth to eighty-four living and twenty dead babies, whereas forty-six women confined earlier than the thirty-fifth week gave birth to twelve living infants and thirty-three dead infants.

Of the thirteen still-born term infants, eight were delivered by forceps (two were *post-mature*), two were de-

TABLE V.

Ante-partum Eclampsia; Effect on the Infants Arranged in Relation to the Various Periods between the Cessation of Fits and the Occurrence of Labour.

Condition of Infant	Interval Between Cessation of Fits and Occurrence of Labour (spontaneous or induced) in days											Total
	$\frac{1}{2}$	1	2	3	4	5	6	7	14	21	35	
Macerated	1	1	2		2	1			5	1	1	14
Still-born	2	1	2				1					6
Living	2		6	2		1	2	1				14
Neo-natal Death			1	1					1			3

In twenty-three patients the fits were *intra-partum*.

In five patients the fits were *intra*- and *post-partum*.

In thirty-nine patients the fits were *post-partum*.

I have analysed the four large groups further in regard to the period of pregnancy at which the fits started. The figures are interesting as I have not seen any similar statistics and I should like to see the figures from a larger series to ascertain if they correspond to these.

livered with the breech presenting, two were natural deliveries, while one was delivered outside.

Difficulty in delivery was apparently the cause of death of some of these infants.

The premature infant seems to perish *in utero* (i.) as the result of toxæmia during the eclamptic attack or (ii.) shortly after the attack from placental infarction or (iii.) during delivery owing to the fact that its tissues are un-

TABLE VI.
Blood Pressures in Eclampsia.

Mothers	Millimetres of Mercury													
	120	130	140	150	160	170	180	190	200	210	220	230	240	
Number	2	5	27	27	34	12	15	10	3	2	4	1	1	

Effect on the Infants.

Ninety-six infants were discharged from the hospital alive; thirty-two were stillborn and nineteen were macerated. Three died shortly after birth. Four mothers died unconfined, two were discharged unconfined with the foetus still alive. In two patients, confined outside, the condition of the infant was not mentioned. Omitting the last four we have a percentage of 62.33 living infants.

I have analysed the results in regard to the infants from three aspects. (See Tables III., IV. and V.).

able to withstand the strain of labour.

Two women who had recovered from *ante-partum* eclampsia, were discharged (at their own request) during the second week with the foetus still alive. All the other living infants were born within one week of the cessation of fits. These two women, the two women delivered by Cæsarean section with living infants and the four mothers who died unconfined are not included in the above list.

Table V. brings out a point on which I should like to see further figures. When should labour be induced in

women who have recovered from the eclamptic seizures? The figures indicate that induction, if there is a chance of a living infant, should not be postponed for more than a week.

Blood Pressure During Eclampsia.

Table VI. shows the maximum recorded blood pressure in one hundred and forty-four women; in fourteen it was not recorded, as these pressures are nearly always taken by nurses; the palpatory method is used.

The chart shows that the blood pressure is more commonly found to be between 140 and 169 millimetres of mercury. Of the eleven women with pressures above 200 millimetres five were primiparæ and six multiparæ. All the primiparæ were above thirty-three years of age. Two multiparæ were twenty-seven and twenty-nine years and the others between thirty and forty. The exceptionally high blood pressures seem to occur in the later periods of child-bearing life and in all probability are due to chronic nephritis.

Previous to making this statistical inquiry I was of the opinion that the commonest blood pressure was about 180 millimetres, but this graph indicates a lower reading than I expected.

There is no doubt that the toxin in eclampsia produces spasm of the smaller arterioles with resulting increase in blood pressure. In the pure toxæmic case the blood pressure usually comes down to normal within a week, in the case with chronic nephritis it takes a longer time to come down, usually two to three weeks and then frequently remains above the normal line.

The Treatment of Eclampsia at the Royal Hospital for Women.

As the patients in this series have been under the care of seven different honorary medical officers, there have been slight individual differences in the treatment adopted, but the differences are only minor ones and have not appreciably altered the general routine.

The patient is given a high soap and water enema upon admission; if this is returned clear, a high magnesium sulphate and quinine sulphate enema is given. If the patient can swallow, she is given a purgative, most commonly four grammes of compound powder of jalap. If she is unconscious and especially if there has been vomiting, the stomach is washed out and either four grammes of compound powder of jalapæ or from thirty to sixty grammes of magnesium sulphate in solution are run into the stomach before the tube is withdrawn. In thirteen patients the stomach was washed out.

Hot fomentations are applied to the loins frequently.*

The patient is left as quiet as possible and great care is taken to see that the airway is kept free of vomit and mucus; the throat is swabbed out and the woman kept lying on her side with her head low.

In twenty-two women this eliminative treatment was all that was needed.

Oxygen is administered after convulsion if cyanosis persists.

Morphine was given to one hundred and eighteen women of this series; a few had up to 0.09 gramme, the great majority not more than 0.03 gramme.

If the fits persist "Veratrone" is generally used; seventy-

two patients had one or more doses of this drug; in thirteen of them "Veratrone" was not preceded by morphine.

Venesection is usually reserved for patients with persistent cyanosis and especially those with symptoms of failure of the right side of the heart. Venesection was performed on eleven occasions.

Saline solution is rarely used. It was given intravenously to one patient of this series and subcutaneously to three.

The obstetrical treatment has been as follows. Cæsarean section was performed twice, de Ribes's bag was used five times, craniotomy was performed twice and forceps were applied upon forty-two occasions.

Induction was performed on five patients with *ante-partum* eclampsia before the fits had ceased and in two the fits started during induction for albuminuria of pregnancy which was not responding to treatment.

You will see from these figures that there has been a minimum of obstetric interference in this series of cases, except perhaps in the case of forceps during the second stage of labour.

There has been a gradual decrease in the mortality from eclampsia at the Royal Hospital for Women for many years. This satisfactory decrease seems to me to be due to several factors, including (i.) improved and practically routine nursing treatment, (ii.) a minimum of obstetric interference, (iii.) control of the fits by a reduction of the blood pressure until the bowels are acting well and (iv.) avoidance of subcutaneous and intravenous injections of saline solution which I think are contra-indicated as the urinary secretion usually does not increase till twenty-four to forty-eight hours after delivery or cessation of fits.

"Veratrone."

"Veratrone" which has been used at the Royal Hospital for Women since 1908, has received a good deal of attention in the obstetric literature of England and Scotland within recent years and it might interest you to hear my conclusions as to (i.) its indications, (ii.) the results to be expected from its use in cases of eclampsia and (iii.) its disadvantages.

The indications are a raised blood pressure and an increase in pulse rate. The period at which its use is most advantageous, is that when we are trying to promote free evacuation of the bowels. This period is usually from six to twenty-four hours in duration.

"Veratrone" used in eclampsia brings about a fall in the blood pressure and decreases the pulse rate. With the fall in blood pressure there is a tendency for the fits to cease. As the blood pressure varies so much in different cases of eclampsia, a definite amount of reduction of blood pressure necessary to control the fits cannot be estimated, but in regard to the pulse rate if it can be kept under eighty, fits rarely occur. A pulse rate of eighty is about the maximum for safety. When the pulse rate is above ninety, the fits certainly tend to recur.

The desired effect can usually be obtained with a subcutaneous injection of 0.30 milligramme in mild cases. For some patients a further dose of 0.24 milligramme is given about twenty minutes later if the blood pressure and pulse rate have not fallen too much. Further doses of 0.12

milligramme or 0.18 milligramme are given as the blood pressure and pulse rate tend again to increase.

The disadvantages of the drug are two in number. Firstly it varies in its effects in different women; in some its effects pass off within an hour, in others the pulse rate and blood pressure will remain down for about four hours. Secondly, with the large doses usually recommended at times severe reactions follow, the pulse rate dropping to about thirty, the respiration rate to five or six per minute and the blood pressure to about 70 millimetres of mercury.

Prophylaxis.

The late Dr. Ballantyne, of Edinburgh, who did so much to further ante-natal work, was most optimistic in regard to the prevention of eclampsia, whilst the late Dr. Gordon Ley, (7) of London, seemed to be unduly pessimistic as he stated that only about 10% of cases of eclampsia are preventible.

Statistics of the Royal Hospital for Women show that ante-natal treatment of albuminuria of pregnancy will prevent the onset of eclampsia in the great majority of cases and in the small minority of treated women in whom eclampsia supervenes, the disease is mild. In the last seven and a half years we have had six hundred and fifteen patients with albuminuria of pregnancy under treatment in the hospital. Of these only seven developed eclampsia. Of the seven the eclampsia developed within twenty-four hours in one of the seven, within forty-eight hours in two and from four days to three weeks after admission in the remaining four. All of these patients recovered.

Last year I published figures (8) showing that the attendances at the prematernity departments of the Royal Hospital for Women had increased tremendously during the last few years. I have no doubt that this increase has been the main cause of the reduction of the number of patients with eclampsia admitted into the hospital as is indicated by the following figures: During the period 1911 to 1915 there were one hundred and twenty-three patients with eclampsia, a ratio of one case of eclampsia to sixty-two confinements, whereas during the period 1916 to June, 1923, there were one hundred and fifty-eight patients with eclampsia, a ratio of one case to eighty-one confinements.

Conclusions.

The conclusions I have come to in regard to the toxæmias of pregnancy and which I suggest should form the basis for your discussion, are:

1. Vomiting of pregnancy is best treated on the assumption that it is due to a disturbance of carbo-hydrate metabolism.

2. Albuminuria of pregnancy varies in its response to treatment according as the toxæmia or chronic nephritis is the main causative factor. Ante-natal treatment of albuminuria of pregnancy causes a considerable diminution in the number of cases of eclampsia.

3. Accidental hæmorrhage is a toxæmic manifestation in a large number of cases.

4. In regard to eclampsia the figures that I have submitted tend to prove (a) that the cases of eclampsia in which the fits start before labour, are usually at an earlier period of pregnancy than the cases in which the fits start during or after labour; (b) that the infantile mortality is greater in the cases in which the fits start before labour,

(c) that prematurity is the main cause of the large infantile mortality in eclampsia, (d) that the blood pressure is raised in practically all cases of eclampsia and that the exceptionally high pressures are found in cases with a pre-existing chronic nephritis and (e) that the low maternal mortality rate at the Royal Hospital for Women is due to the fact that there is a more or less routine method of treatment together with a minimum of obstetric interference.

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- (4) Gordon Ley, "The Practitioner's Encyclopædia of Midwifery and the Diseases of Women," page 135.
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- (7) Gordon Ley, "The Practitioner's Encyclopædia of Midwifery and the Diseases of Women," page 140.
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DR. R. G. SCOTT (Hobart) opened the discussion and called attention to the necessity of looking for some further cause of toxæmic vomiting. While he agreed that it was due to faulty metabolism, he held that the cause of the pathological lesions which was responsible for the fault, should be sought. He said that the greatest hope lay in prophylaxis and ante-natal treatment. There had been much confusion in the treatment and he supported Dr. Windeyer in maintaining as near as possible a routine plan of treatment. He advocated starvation; only water should be given for three days. Ordinary eliminative measures should be adopted.

DR. L. LEON JONA asked for a uniform definition of eclampsia for the better comparison of statistics. There was no knowledge regarding the nature of the toxin and its incidence on various organs varied in different individuals in differing degrees; the brain, retina, kidneys, liver and pancreas might be chiefly affected. Pancreatitis with accompanying epigastric sensation was not uncommon.

In a discussion of the predisposing causes of eclampsia Dr. Jona laid emphasis on desiccation of tissues. Experimental work had been carried out in which animals were kept under conditions in which the ingestion of water was limited, or alternatively they were injected with Ringer's solution of ten times normal strength. Such animals were more liable to convulsions on the injection of strychnine than normal animals.

Apparently eclampsia was more serious in some localities than in others and climatic conditions influenced its incidence and fatality. Prophylaxis might be furthered by insisting that the patient took plenty of water in addition to attention to the usual measures of ante-natal hygiene.

DR. A. W. NANKERVIS suggested that toxæmic vomiting might be due to some concomitant condition of pregnancy such as retro-displacement of the uterus or *Bacillus coli*

infection of the urinary tract and said that he often found that the vomiting cleared away when the concomitant disorder was corrected.

With reference to the vomiting associated with albuminuria he was of opinion that it was necessary that all practitioners should have a good bio-chemical training in order to be competent to make earlier diagnosis in toxæmic vomiting of pregnancy. Country practitioners were obliged to base their estimate of severity in any given case on rise of blood pressure and cardiac changes, whereas if they were in a position to carry out estimations of blood urea, their work would be much more accurate.

DR. A. J. GIBSON congratulated Dr. Windeyer on his fine results. In a series of about ninety-one cases of eclampsia collected at Crown Street over the same period of time the mortality had been 10%. The treatment carried out was very similar to the routine adopted at the Royal Hospital for Women; he was sure that conservative methods were correct for eclampsia. In the dangerous state which ensued on the onset of pulmonary oedema, he found it a great help to lower the head over the side of the bed in order to allow the mucus to run out. This measure along with eliminative treatment and management conducted on approved general lines had been of assistance in saving life. He would like to hear more concerning the ætiology of eclampsia. Focal infections might play an important part and some authorities had implicated placental infarcts. These two theories might be combined in the following manner. Some infective agent, such as the streptococcus, might produce changes in the placental circulation and bring about degeneration which would be the source of the toxin that circulates in the blood. Endocrine instability had also been charged with being the underlying disorder in eclampsia.

DR. A. NORMAN McARTHUR urged the importance of a consideration of a deficiency of ovarian secretion. He had read reports of cases in which injections of *corpora lutea* had been given and the best results had usually been obtained by intravenous injection. There had been some dramatic results after such treatment in pernicious vomiting.

DR. DUGUID said that he had seen "Veratrone" used extensively in Glasgow, but he had latterly abandoned it owing to its failure to improve the general results in treatment. He pursued treatment on conservative lines. With more thorough and complete ante-natal supervision the radical measures of the past were seldom necessary. It was essential that more should be learned about the causation of the toxæmias of pregnancy, but the greatest hope lay in pre-natal observations. The effect on the pancreas should be considered as well as the known effects on other organs. He spoke of three patients in whom pruritis failed to respond to the usual measures; on qualitative and quantitative examination of the urine it was found that more than the normal amount of sugar was present in the urine. Blood sugar estimations were also carried out and treatment instituted on diabetic lines with immediate gratifying results.

DR. FOURNESS BARRINGTON based his remarks on clinical considerations. The vomiting of pregnancy was chiefly neurotic and was very seldom toxic in origin. He found good results attended the deep intramuscular injection of extract of *corpora lutea* in neurotic women, but not in those who were genuinely toxic. Rest and regulation of the diet were of supreme importance in the management of the pre-eclamptic state. He agreed with Dr. Gibson that many eclamptic patients suffered from thyroid inadequacy.

The indications for the induction of labour in the pre-eclamptic state were: (i.) severe epigastric pain, (ii.) severe neuro-retinitis and (iii.) diminution in the amount of urine. At the time they were greatly helped by renal efficiency tests. He was a firm believer in "Veratrone" in doses of 0.01 gramme every quarter hour until the pulse came down to 80 per minute. "Veratrone" also increased the amount of urine excreted. Morphine was a great saver of life; it diminished metabolism and increased the excretion of urine. He felt sure that the minimum of interference was the secret of Dr. Windeyer's good results.

DR. ROBERT FOWLER said with reference to ætiology that he had attempted some observations in this direction by examination of the *liquor amnii* in the search for the toxic agent. He had, however, obtained no conclusive results.

It sometimes happened that in women with albuminuria in spite of rigid ante-natal care and frequent analysis of the urine eclamptic symptoms came on very acutely within a few hours. Dr. Fowler urged the value of Cæsarean section in primiparæ in whom labour had not commenced. In this type the members of the honorary staff at the Melbourne Women's Hospital were agreed that excellent results attended the operation. The total mortality in a series of patients treated by routine conservative methods was 23%, but that in the series in which Cæsarean section had been adopted was 10%.

He employed spinal analgesia for the operation and considered the results were better than when a general anæsthetic was used. Chloroform was contra-indicated because of the danger of delayed poisoning and ether because of the special risk of oedema of the lungs in eclampsia.

He recommended the lower Cæsarean section, that was operation through the lower uterine segment as having the following advantages over the classical operation. There was not so much hæmorrhage; the scar was right behind the bladder and there was less liability to rupture of the uterus in subsequent labours. Also the risk of sepsis was less.

DR. EDWARD R. WHITE reviewed the ante-natal work at the Women's Hospital, Melbourne, and stated that since its inception no mother had been sent into the wards from the ante-natal clinic with eclampsia. He laid emphasis on the beneficial results attending starvation treatment and said that under a "water diet" albumin in the urine was rapidly reduced in amount. He considered that the most difficult type of eclamptic patient was the primipara early in the period of child-bearing life. If the disorder were allowed to persist, serious permanent damage to internal organs might ensue and he therefore practised induction of labour.

DR. A. M. WILSON said that during the last ten years there had been 16,256 confinements at the Women's Hospital, Melbourne, and convulsions occurred in 362 of the women, a frequency of one in forty-five. The mortality among the eclamptic patients reached the appalling figure of 22.4%. No less than 64% of the women who developed eclampsia, were primiparæ.

He had personally performed Cæsarean section in five eclamptic patients, but reserved the measure for desperate cases. He always tried conservative methods and resorted to Cæsarean section when they failed. Prophylaxis must be taught both to the public and to medical men. Cards containing information about important warning signs should be printed and distributed. He was greatly impressed with the value of induction of labour and the results achieved when labour was induced before the onset

of fits were very satisfactory. He was very jealous of the principle of "safety first."

The President congratulated Dr. Windeyer on his paper and on the good results he had shown for both mother and baby. He was much impressed with the simplicity of the whole regime.

Dr. Windeyer, in reply, said that all the patients he had considered in his paper had been seriously ill and had reached the stage of convulsions. He had excluded all in whom the diagnosis was doubtful. He felt that during the last few years the results of treatment in eclampsia had shown a gradual improvement.

MAINTENANCE OF LACTATION.

By MARGARET H. HARPER, M.B., CH.M. (Sydney),
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for Children, Sydney.*

THE requirements for successful lactation are a healthy mother leading a regular normal life and a contented baby who stimulates the secretion of milk by regular emptying of the breasts. Every mother and infant should fulfil these requirements, but unfortunately difficulties arise and many babies are unnecessarily exposed to the hazards of artificial feeding.

If we have the good fortune to see these infants before they are put on artificial food, we shall find that there has been lack of proper management and handling of the infant. Very rarely is the quality of the milk at fault. The composition of human milk varies within quite wide limits. In the case of a foster mother who was producing 2.36 litres (eighty-three ounces) of milk daily and whose infant was seven months old, examination showed that her milk had the following percentage composition: carbohydrate 7.1, fat 3.9, protein (with extractives).

This milk was given to premature infants, to weaklings and to those who were suffering from damaged digestions. In every case it was well-borne and the babies flourished. The chemical examination of the milk supplied by a mother whose infant is not thriving, may be a source of confusion rather than of help. No infant should be weaned because the chemical examination of the milk shows a marked departure from what we are accustomed to consider the normal.

In those rare cases in which the infant is not gaining in weight and the milk, though ample in quantity, is found to be deficient in fat, the addition of cod liver oil emulsion to the baby's diet is usually all that is required.

With regard to overfeeding the trouble is easily overcome. The infant is restless with attacks of pain and screaming and is almost always fed too frequently.

On regulating the feeding and lengthening the intervals between the meals the change in the infant is striking. It becomes happy and contented and sleeps well.

Overfeeding, if allowed to continue too long, will result in lack of appetite in the baby with consequent diminution in the milk supply and finally in weaning. The restlessness and screaming of the infant will upset the mother disturb her rest and render her unequal to the task of suckling.

In cases of underfeeding there is a falling off in the milk supply due to lack of sufficient stimulation on the part of the infant or less frequently to some fault in the mother's regime.

In such cases the mother's diet and mode of life must be investigated and any errors corrected. Overfeeding has the effect of diminishing rather than of increasing the milk supply. It is not reasonable to suppose that by overburdening the digestive and eliminative organs, the supply of milk will be increased. For the maintenance of a good supply of milk a simple, sufficient and well-balanced diet with an adequate amount of fluid is all that is necessary. The mother must have proper rest and sleep with time to carry out the direction of her household. To secure this the longer intervals between feedings and a long interval at night from 10 p.m. to 6 a.m. are essential.

Fresh air and exercise are necessary to a healthy life always and more particularly so in the case of a nursing mother.

With regard to the infant the most common cause of failure to maintain lactation is ineffective sucking.

If the infant be observed carefully in cases where the supply of milk is failing, it will be found very frequently that he does not suck properly and that he fails to empty the breasts. As an example of such a condition I may quote the case of a mother, who having failed to suckle her first child, placed herself under observation immediately after her next confinement. This baby at the end of the first fortnight of his life had lost a half of a kilogram (about a pound) in weight and was still losing. Test weighing was instituted and it was found that the infant was not taking sufficient milk and that he was not emptying the breasts. The intervals between the feedings were lengthened and after each suckling, the breasts were stripped manually and the expressed milk given to the baby. In about a week the infant was sucking sufficiently vigorously to obtain his full calorie requirement and was gaining in weight. Thereafter no trouble was experienced in maintaining lactation.

The most common causes of ineffective sucking are three.

(1) The formation of bad habits during the early days of life. Exhaustion after a difficult labour may be the cause of weak sucking in the first days of life. The infant may be allowed to sleep at the breast. A comforter may be given and the habit of nibbling instead of sucking be established. If the breasts are engorged and hard, the milk is difficult to obtain and the infant being too weak for prolonged effort, may become less and less able to suck effectively.

Any or all of these causes may be operative in establishing a habit of laziness in sucking, with incomplete emptying of the breasts.

(2) Apart from such abnormalities as hare-lip and cleft palate, there may be some slighter deformity which has escaped notice, such as cleft soft palate or nasal obstruction. In cases where suckling is impossible, lactation may be maintained by artificial methods of stimulation, such as manual expression of the milk, hot and cold sponging and massage. We have records of such cases where the infant has been fed entirely with mother's milk for some months and partially up to the eighth or ninth month.

(3) Lack of appetite in the infant. This may be due to too frequent feeding. The two-hourly interval between feedings is hardly ever advisable. Even in the case of small babies and those who are premature the longer interval is sometimes better. One premature baby weighing 1.4 kilograms (3 lbs. 1½ ozs.) was being fed at two-hourly intervals and was only taking 55 calories in twenty-four hours. It was difficult to get her to take even this quantity. On lengthening the interval to three hours she took 77.5 calories in the following twenty-four hours. Progress after this was more rapid and satisfactory.

Each infant must be treated individually. One cannot adhere in every case to hard and fast rules.

An infant five weeks old whose weight was 3.4 kilograms (7½ lbs.), her birth weight, was taking only half the required number of calories in the twenty-four hours when she was fed every three hours. She was difficult to rouse, and had little appetite. The interval was changed to four hours with the happiest results. The sucking was stronger and more effective and in a fortnight she was obtaining all her food from her mother and with no further difficulty was breast fed until she was nine months old.

Lack of appetite may be due to some acute infection, such as bronchitis, pneumonia and so on. In such cases the milk may be maintained by the stripping of the breasts after each time of suckling to insure complete emptying until the appetite returns and the infant empties the breast by his own efforts.

Unhygienic surroundings may be the cause of lack of appetite. Lack of the stimulus of fresh air and sunlight, too much clothing and too much handling may all help to diminish appetite and so render the infant's sucking ineffective.

(4) Some reflex irritation may be the cause of failure to maintain lactation. A thorough physical examination of the infant should be made in all cases where any difficulty is experienced.

Such a reflex irritation, due to a slight unnoticed malformation, was the cause of failure to maintain lactation in the following case:—

An infant aged three months was weaned because of restlessness, fits of screaming, frequent green stools and failure to gain. The mother had successfully suckled two other infants and was most unwilling to believe that her milk was at fault. However, in desperation she yielded to the advice given her and weaned the baby. It was found that he had a glandular hypospadias with a membrane almost completely covering the urethral orifice. When micturition took place, the membrane ballooned up and a very thin stream of urine was passed. On removal of the membrane, all untowards symptoms disappeared, the motions became normal, the child happy and comfortable, and lactation was re-established without difficulty.

(5) Nervous unrest in the child is perhaps one of the most common causes of early weaning and is one of the most unjustifiable. In all cases it is caused or at any rate perpetuated by mismanagement and it can only be cured by nurse, mother and medical adviser who thoroughly understand the difficulties and are prepared to overcome them with patience and skill. Too little considera-

tion is given to the psychological aspect of the relations between mother and infant. The nervous mother often has a very disturbing influence on her child. The following is the history of such a nervous infant. The mother, also being in a nervous condition, had occasionally lost patience and handled the baby somewhat roughly. When they came under observation the baby was in a pitiable state. Whenever she was given to the mother to suckle, although the breasts contained milk, she refused to suck. She screamed and struggled until she became exhausted. When, however, she was given to a foster mother she went to the breast comparatively calmly and took more food. This infant, although only two months old, had reacted to the nervous impatience of her mother by attacks which resembled pure terror. It was only after much patience and perseverance on the part of the mother and the nurse and with the help of the foster mother that she finally went to her mother's breast satisfactorily and was breast fed to ten months of age.

This condition is sometimes started in the early days of lactation by too rapid a flow of milk awkwardly managed. The infant chokes, becomes frightened and finally refuses to go to the breast.

It is in these cases that Hector Cameron recommends small doses of potassium bromide and chloral hydrate shortly before a meal, so that the infant may be carried to the breast in a calm, drowsy condition.

Such conditions as loss of weight, refusal to suck, abnormal motions, lack of appetite and diminution of the supply of milk are not indications for weaning. They are rather warnings that something in the management of baby or mother is at fault. A thorough physical examination of mother and infant should be made. The daily routine must be investigated. If this is done, the cause of the disturbance will probably be found and measures taken to overcome the difficulty will almost always result in the successful maintenance of lactation.

Most of us recognize the importance of breast feeding in reducing the morbidity and mortality rates amongst infants. But unfortunately there is a wide-spread belief that the modern woman is losing the power to suckle her infant.

In order to combat this disastrous attitude the following measures are necessary.

(1) The realisation by the medical profession of the supreme value of mother's milk to the infant, of the fact that every mother can suckle her infant if not entirely, then partially and that failure to do so is due to lack of proper management and education.

(2) The medical supervision of mother and infant during the first twelve months of the infant's life.

In recent years the public has been educated to realize the necessity for medical supervision during pregnancy. The expectant mother places herself under the care of her medical adviser as soon as she knows she is pregnant. No one will deny the tremendous benefit to both mother and infant which has resulted from this education. It is no less important that mothers should recognize the necessity for medical supervision during the period of lactation.

(3) The training of nurses in the principles and prac-

tice of good mothercraft and infant nurture and especially in the right methods of managing lactation.

This education should be part of the training of every maternity nurse, because on her rests the responsibility of starting mother and infant in right habits. It is in the first three weeks of life that the foundations are laid for successful maintenance of lactation or the reverse.

THE ESTABLISHMENT OF BREAST FEEDING.

By F. TRUBY KING, M.B., B.Sc. (Public Health),
Director of Child Welfare for New Zealand.

THE time available for opening the discussion on the establishment of breast-feeding is very short and as Dr. Margaret Harper has just dealt with maintenance, I shall save time by not recapitulating the essentials which she has enumerated. They are practically the same in both cases, but I may refer to a few points in her paper which seem to call for some comment.

Dr. Harper's first essential for the maintenance of breast-feeding is a healthy mother. Of course we all agree as to the great importance of the mother's health; but still more important is it for us as physicians and guides to realize and insist that even if the mother is not in really good health or even if she is actually suffering from disease, the best thing in general for herself and her progeny is to establish the flow of milk and to maintain it throughout the early months, if not longer, almost the only absolute counter-indication being material phthisis. Yet we know that the commonest professional ground for ordering the mother not to nurse her baby is the impression that she is not strong enough or that owing to some general or local disease, such as a specific fever (including influenza) or mammary abscess, the baby must be weaned. Of course the rule should be to spare no pains to keep up the secretion of milk in such cases, the baby being kept off the bad breast only so long as may be absolutely necessary and not being deprived of milk from the sound breast at all, when only one is suppurating. In the great majority of cases in which the mother is advised or ordered by the doctor or the nurse not to suckle her baby in the early months, there are no adequate grounds for the advice or for supposing that suckling would prove other than beneficial to mother and child.

The second point in the opening paper on which I feel bound to comment, is the attempt to prove by means of a single case in which the mother's milk was estimated to contain about double the average proportion of protein, that such departures from Nature's average are in no way detrimental to the perfect nutrition and health of infants in general, because in this particular case several babies who took the milk in question, seemed to do all right. Obviously their thriving might have been only relative; they would probably have done better if fed more normally. There does not appear to have been any adequate ground for a broad general assumption. It is against all the probabilities to suppose that Nature's average proportion of protein in human milk is not the optimum for the average baby. All reliable observation and experience points the other way, both in regard to man and the other mammals. We cannot improve on Nature in this fundamental and it cannot be a matter of absolute indifference

when there happens to be a wide departure from what has been evolved as the optimum for the species.

However, I cannot in any case accept the contention that 3% of protein *plus* extractives means 2.5% of actual protein. The deduction for extractives should in my opinion be nearly double what Dr. Harper has allowed in this case. Probably the milk did not contain more than about 2% of protein and this proportion, given in the form of human protein, would not appreciably upset the average baby, though the child would be damaged rather than benefited by the excess.

The best way to insure universal breast-feeding is to establish public confidence, to get women to realize that practically every mother can nurse one baby and ought to be able to supply enough milk for twins. We know that investigations in France, Germany and America, dealing with thousands of consecutive cases, have shown conclusively that there should be practically no failure and that in spite of the indifferent health of most city women, they can carry out the primitive function of suckling successfully if properly advised and attended to.

Though ante-natal care is of great importance, we find in practice that even when this has been neglected, due attention to health after child-birth (the hygiene of fresh air, outing, suitable diet, proper intake of fluid, exercise, friction, bathing, regular habits *et cetera*) *plus* certain special local measures, when needed, insure successful breast-feeding in the most unlikely cases. Unfortunately our own profession has been much at fault in this matter and the frequency with which babies are "taken off the breast" by doctors and nurses shows the imperative need for thorough practical training of both professions in this supremely important subject, the establishment, re-establishment and maintenance of breast-feeding.

The local measures which we find of special efficacy, are manipulation and massage of the breasts and extra stimulation by alternating hot and cold sponging. The most important of these measures are systematic manipulation and massage. I was led to adopt this procedure by the extremely significant fact that very simple handling and stroking of the cow's udders after each milking had been proved in Denmark nearly twenty years ago, to induce a much larger yield of milk; and subsequent work along the same lines at the Wisconsin Agricultural Station in America confirmed the Danish findings. The value of the increased yield at Wisconsin was about ten dollars a cow in the course of the milking season. The effect of the systematic special training of nurses in the technique needed for the best results in difficult cases is illustrated by the remarks of Dr. J. S. Fairbairn, of St. Thomas's Hospital, in the annual report (1920) of the Mothercraft Training Centre established on New Zealand lines at Trebovir Road, Earl's Court, London, early in 1918. Dr. Fairbairn wrote:

The wonderful success of the New Zealand methods and the enthusiasm inspired among those who every day witness the living truth of it, should be studied by a visit to Trebovir Road by all those interested in the infant welfare movement. The results in promoting breast-feeding among mothers who had previously failed, are remarkable, but still more striking is the re-establishment of the flow of breast milk, adequate to or even exceeding the infant's need, after as long as

even six or seven weeks' weaning from the breast. A few years ago such results would have been looked upon as bordering on the miraculous; now they are an everyday occurrence at Trebovir Road. . . . The knowledge of the methods learnt there and spread throughout the land by the nurses, midwives and doctors who have studied them, and even by the mothers themselves in their gratitude for what has been done for them and their babies, is something which cannot be shown in any report or by any statistics.

In addition to dealing with the breasts as a whole, it is imperatively necessary for medical students and nurses to understand the technique of emptying the breasts by expression in the region of the areola. Not only does this empty the breasts more completely than the use of any form of breast-pump, but if properly done even by the mother herself (after due instruction) it is capable of inducing a greater flow of milk than can be brought about in most cases by suckling, just as the hand milker will get more from a cow than could be drawn off by calves. Hence it is that skilled hand-expression is so invaluable where the baby happens to be premature or specially weakly at birth. In the majority of such cases the baby should not be put to the breast for a week or more, the flow being established by hand and the baby being fed in the meantime by pipette or bottle with the expressed milk.

I need go no further into any such matters, because they are more fully dealt with than would be possible here in the small book, "The Expectant Mother and Baby's First Month" which is issued gratuitously to mothers by the New Zealand Government, and is published by Messrs. Angus and Robertson for Australia. A few copies are on the table and can be had on application.

In conclusion I would merely draw your attention to pages 48 to 50 of the little book in question, as conveying what I feel to be the practical essentials for establishing or re-establishing breast-feeding in difficult cases.

THE ESTABLISHMENT AND MAINTENANCE OF BREAST FEEDING.

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THE difficulties of maintenance of breast-feeding are much the same as those of establishment with some added. The difficulties common to both are ignorance on the part of nurses of the method, and of the importance of the subject. The ignorance is encountered in nursing homes and in some doctors. Then there are economic difficulties, Gross negligence also appears. In the second place there are physical difficulties. In the mother there is painful suckling, depressed nipples, and delicate skin. General illnesses of the mother also provide difficulties. There may be no milk. On the part of the baby there may be cleft palate, hare lip, prematurity and debility, congenital diseases and other disabling condition. The third group of difficulties comprise the psychological attitude. There may be indifference on the part of the mother or other over-anxiety on the part of the mother, nervousness, shock or grief and over-fatigue. There may be nervousness on the part of the baby. In the fourth group there may be some

deficiency in the mother which leads to deficiency in quality or quantity of the milk.

Suckling, like pregnancy, makes a profound demand on a woman's energies. It is the placid type of woman who is the best mother in this respect, never the nervous, anxious person. I have known a number of intellectual women who have nursed their babies and they have told me that they have found it impossible to combine any vigorous mental exercise with suckling; one of the two had to suffer.

One friend told me that after refusing to undertake some political work for the first six months of her baby's life, she decided to wean him and after giving him his last feed, went out and plunged into work. Not another drop of milk appeared. We have all seen this happen after violent emotion or shock and still more often in less degree from the effect of anxiety or fear, producing the less violent effect of lessening the supply and changing the quality of the milk. In life as we know it, over-fatigue plays a very important part. The mother comes back from her nursing home or the nurse takes her departure and the house with its anxieties of management, the actual labour involved is on her hands. What wonder if the new baby suffers?

Many mothers can with encouragement and management be greatly helped. The three-hour feed with its longer rest for mother and baby, the long night interval, various helps for the small troubles and so on can get over many difficulties otherwise insuperable.

The three-hour interval is probably suited to most babies, but not necessarily to all. Some do much better on feeds every four hours, while some very ill babies seem much happier if given feeds every two hours and gradually worked on to longer intervals. No one rule is good for all. Babies from the first have their distinctive characteristics.

Intercurrent illness on the part of the mother or baby is a very frequent cause of failure of maintenance.

A small baby, four and a half months of age, fed at the breast, was brought to me at hospital with the history that, two weeks before, it had begun to vomit and had green stools. The doctor had told the mother that the milk did not agree with him and that she should wean him. She found it difficult to feed him with a bottle; he did not want it and so she brought him to the out-patient department. Further inquiry into the history showed that the illness began with a shiver and fever and that there was pyuria. Alkaline treatment and a return to the breast was successful.

Common colds often have a most serious effect, the loss of energy by the mother leading to diminution in supply and the baby's sucking power and appetite being diminished, the supply fails.

Breast abscess in my opinion, should not necessarily be a cause for weaning, but it is the practice of some doctors to wean at the first sign of trouble.

Supplementing.

Knowing as we do how often this is necessary and how valuable, it is surprising to find how many doctors tell the mother that they cannot mix milks and that if there is not enough milk, the baby must be weaned. I admit that unless one is very careful, supplementing means weaning, owing to the ease with which the baby obtains milk from the

bottle. Of course, this is so much the more, the earlier supplementing becomes necessary. We all know the child of a year or more who, though taking ordinary food, refuses to be completely weaned and we know also the nine or ten month child who refuses all other food but breast milk, until actually forced by hunger or thirst to take it.

Supplementing breast milk, I believe, was necessary in many cases or children would have been underfed for months. This has been one of the factors preceding the development of rickets and other troubles and it is far preferable to weaning. Of the reasons given for weaning in this series, many were impossible to find out, but puerperal sepsis, abscess of the breast, absence of breast milk all played a part. Condensed milk bottles are given in many nursing homes. This is also a cause. Next there is failure of the baby to gain in weight. At times weaning has been effected because of the extreme discomfort and dissatisfaction at the feeding, though apparently there was plenty of milk. Some of these children, if given a test feed, prove to be inadequately fed, while in others the defect must be in some quality of the milk, possibly a toxic factor which makes it unsuitable to the child. In this case when the child is put on to milk and water or other simple food, he instantly becomes comfortable, happy and thrives.

When considering breast feeding it is perhaps not out of place to speak about one of those conditions usually regarded as a contra-indication, I mean open tuberculosis of the mother. I see that Pritchard states that this is not a contra-indication on account of the immune substances contained in the milk of such a mother and also on account of the absence of tubercle bacilli from breast milk.

Personally I believe this to be true, but consider that breast feeding in such cases is dangerous as it involves the mother handling the baby. Those who have any intimate knowledge of the difficulties of preventing infection of clothes, hands and so on, must realize that the infant probably receives an overwhelming dose of the infecting agent, far more quickly than can be combined by any immunizing substance. I believe that the ideal would be for the mother to nurse her baby and not to handle it, but it must be seldom that such conditions could be managed.

THE ESTABLISHMENT AND MAINTENANCE OF BREAST FEEDING.

By VERA SCANTLEBURY, M.B., B.S.,
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In the few minutes at my disposal I wish to emphasize a few points in connexion with the subject of establishment and maintenance of breast-feeding under the two following headings:

(1) The practical value of health centre methods as taught and practised in the Victorian Baby Health Centres, with one or two examples.

(2) The importance of the education of all those concerned in the care of the baby: (a) The medical student, the future doctor, (b) the student nurse, the midwifery nurse, the special health centre nurse, (c) the parents, the father as well as the mother.

Health Centre Methods.

By health centre methods we mean advice to the mother in ante-natal and post-natal periods regarding adequate rest including midday rest and rest while feeding the infant, graduated exercise without fatigue, nourishing diet, three good meals daily with balance regarding fat, protein and carbo-hydrate, fresh vegetables and fruit, value of hydro-therapy, both internal and external, regulation of daily habits, influence of baby health centre methods on mother's nervous condition.

Baby S. The home conditions were good, but the mother went out little. The baby was vomiting food. It was fed irregularly. It was seen first on July 9, 1923, at the age of five weeks when its weight was 5.67 kilograms (12 lbs. 8 ozs.). Regular feedings were instituted and the baby was better and gaining. On August 29, 1923, the weight was 6.66 kilograms (14 lbs. 11 ozs.). On September 3, 1923, a sudden death took place in the family; the breast milk was gone for two days. The mother was advised to go out for one hour each morning and afternoon, to rest for one hour on her return; she should continue breast-feeding every three hours and douche her breasts. The baby returned to the breast. On September 25, 1923, the baby was taking the breast and was gaining well; the weight was 7.3 kilograms (16 lbs. 2 ozs.). On October 9, 1923, a second sudden death occurred in the house. The mother was greatly upset, but was doing health centre treatment at the time and there was no effect on breast milk. The baby continued to gain.

In regard to the education of the baby in sucking, the importance of education in the first ten days should be specially emphasized to the midwife and the mother. Importance is attached to regular habits. The intervals of feedings should be three or four hours. Attention is paid to the method of feeding (posture, rate) and to the regulation of defaecation. The third point is the care of the baby and clothing is important.

A baby on the breast was brought to the centre in many cotton clothes. It was being fed regularly and there was sufficient breast milk, the child was pale, thin and not thriving. An alteration to suitable woollen garments was made but no other treatment was given. The child gained 226 grammes (eight ounces) during the next week.

Bathing and fresh air and sunlight are also prescribed. I have given some examples of success by use of baby health centre methods under the following headings.

Maintenance of Breast Feeding.

Baby W. was constipated so badly that he was ordered off breast by a medical practitioner. The mother visited the centre when the child was four weeks of age. His weight was 4.05 kilograms (8 lbs. 15 ozs.). He was fed every three hours. At the age of two months his weight was 5.05 kilograms (11 lbs. 2 ozs.). The feedings were given every four hours and attention was paid to regularity. Orange juice and massage to abdomen night and morning were ordered. The baby was given 0.6 cubic centimetre of boiled water between the feedings. The baby did well; his bowels became regular; he was entirely breast-fed.

Re-Establishment of Breast Feeding.

Baby A's mother was at Fairfield Hospital for five weeks with diphtheria. She was advised to use the breast pump and to express her milk fully while in hospital at regular intervals. The baby was fed meanwhile on "Lactogen" by spoon. When the mother returned it was breast-fed almost entirely (only one complementary feed being

given). At six months the weight was 6.97 kilograms (15 lbs. 5½ ozs.).

Baby J. took the breast for two days. It was then taken off by nurse in hospital who said baby could not suck. "Lactogen" was given. The baby visited the centre at the age of five weeks, weighing 3.17 kilograms (7 lbs.). It had weighed 3.3 kilograms at birth. It was given breast plus complementary milk and water. At end of one month after the first visit it was entirely breast-fed. Its weight was 3.83 kilograms (8 lbs. 7¼ ozs.). At nine months it was difficult to wean.

Baby S. had the breast for three days. The mother then had scarlet fever and was sent to Fairfield. The baby visited the centre when it was two months old. The breasts were massaged and douched; the mother was given a diet with more protein, water to drink in plenty and a midday rest. On the fourth day after the visit the baby refusing bottle and was fed entirely on the breast.

Baby A.'s mother had inverted nipples. Plaster and a binder were applied to the breasts in hospital. The baby was put on "Glaxo," then on "Lactogen." The mother was anxious to feed her baby, so douched and massaged her breasts. The baby was fed at the breast regularly. It is now entirely breast-fed. Its weight at six months was 7.25 kilograms (16 lbs.).

Ante-Natal Care (Baby Health Centre Method).

Baby B.'s mother had never fed any of previous five babies for more than three weeks. She was given health centre methods during the last three months of pregnancy. She fed her child for four and a half months; then all family including herself caught influenza.

Baby S. The first child aged three and three-quarter years had been fed on cow's milk. The second child had had condensed milk; it had died at four months from colitis. The mother was given health centre methods before the birth of the third baby, including attention to inverted nipples, castor oil and spirits to the nipples, clay pipe and douche and massage. She visited the centre when her baby was three weeks old. The baby gained 680 grammes (1 lb. 8 ozs.) on breast only in three weeks.

Baby S. Six previous children had all been artificially fed. The mother was given ante-natal treatment for her seventh child which was entirely breast-fed.

Test Feedings.

Test feedings are a valuable guide to the amount baby is getting daily or at special times of day and to the amount necessary for complementary feeding or in failing cases, either as temporary or permanent measure.

Complementary Feedings.

Complementary feeding are always better with the spoon.

Baby S. weighed 4.75 kilograms (10 lbs. 8 ozs.) at birth. The worrying mother visited the centre when the baby was thirteen weeks; the baby then weighed 4.04 kilograms (8 lbs. 14½ ozs.). It was given breast and cow's milk with a spoon. A test feed was given. It gained up to 5.44 kilograms (12 lbs.), when the mother insisted on bottle feeding. Next day the baby absolutely refused to touch the breast. This is one of many babies who refuse the breast as soon as bottle fed.

These feedings are used as temporary help when the mother is tired or menstruating or for other reasons.

The following case is an example of dropping complementary feeding by training the mother in health centre methods.

Baby was on the breast and "Lactogen"; it was overfed and had indigestion. It was not gaining. On breast only with regulation it gained well.

Influence of Menstruation.

Early menstruation often affects the baby, making it cross and fretful. Some actually gained 85 to 113 grammes (three to four ounces) per week. One gained 170 to 227 grammes (six to eight ounces) per week, the average for this baby being 85 to 113 grammes. There is no need to wean on account of menstruation.

Extra rest for the mother is obtained by giving temporary complementary feeding if there is loss of weight as shown by test feeding. This is sufficient.

Education of Students and Nurses.

Regarding the second point of education of medical students and midwifery nurses in health centre methods, I would urge the sympathetic cooperation of the obstetricians and the health centre workers in the formation of a model health centre at the women's hospital. It should include a centre for visiting mothers, also two beds for mothers who have difficulty in feeding, and a cot for premature infants.

Thus would opportunity be given for the scientific care of the mother and babe, for collection of statistics and knowledge to benefit future generations, and to students for continuous observation and learning of the important factors which contribute to the maintenance and establishment of breast-feeding.

DR. TRUBY KING said that for many years he had recognized the supreme importance of breast feeding. The healthy mother was the ideal, but all women, whether healthy or not, if properly cared for before and after delivery could nurse their babies either completely or in part. Exceptions were very rare. Most mothers could nurse two babies. He detailed the methods of artificial stimulation of the breast and advised expressions of the mamma during the first two days in addition to suckling.

THE TREATMENT OF UTERINE TUMOURS, INNOCENT AND MALIGNANT.

By RALPH WORRALL, M.D., M.CH., O.V.I.,
Gynaecologist to the Sydney Hospital and Surgeon to the Coast Hospital.

Inspired by Professor Watson I did my first subtotal hysterectomy by the Baer method in February, 1899, and since then have performed 380 operations with six deaths, 1.5%. The last 159 have been consecutive recoveries. Of the fatalities one was due to sepsis, one to embolism, one to shock in removing a huge fibro-cyst for which two unsuccessful attempts at removal had already been made, one to ileus on the sixth day. The *post mortem* examination showed that the patient might have been saved by reopening the abdomen. One was due to hæmorrhage in a very weakened patient and one to intestinal hæmorrhage on the thirteenth day. The *post mortem* examination showed no ulceration in the duodenum; the remainder of the intestinal tract was not examined by the pathologist, so that this very interesting case was never cleared up.

The end results have been usually very good, but one patient developed cancer of the cervix, two suffered from occasional hæmorrhage and quite a number complained of discharge. When the health did not reach a high level, I am inclined to believe that toxæmia from a diseased cervix was responsible. I have reported three cases of cancer at

tacking the stump of the cervix left after a subtotal hysterectomy. My colleague, Dr. Cedric Bowker, has had one case, while a considerable number of similar instances have been reported in the medical journals.

These untoward results would not occur if it were recognized by the profession generally that subtotal hysterectomy when the cervix is injured or diseased is reprehensible. I hope a unanimous opinion to that effect will go forth from this Congress and thus prevent such a practice as the treatment of chronic metritis by subtotal hysterectomy, that is the removal of part of a uterus which is wholly diseased. Such operation can but half cure the patient and will leave her exposed to the danger of cancer of the cervix.

Impressed by this experience I endeavoured to obviate the defects of the subtotal operation by resecting the diseased cervix prior to performing abdominal section for the subtotal hysterectomy. This was not altogether satisfactory and I was led to the more general adoption of total hysterectomy by the technique described in the text books.

Since 1908 I have performed ninety-nine of these operations which I call "complete" hysterectomy. Nineteen were for cancer of the body, one for sarcoma, one for chorion epithelioma, six for supposed cancer of the body; the others were for fibro-myoma with diseased and lacerated cervix, adeno-myoma and chronic metritis.

There were four deaths, 4%, one was from pneumonia; one from embolism; one from premature and unauthorized removal of the silk worm gut sutures on the seventh day (with consequent rupture of the wound, escape of the intestines and septic peritonitis), one from shock and hemorrhage (the patient was ensanguined at the time; my diagnosis was cancer of the body; the condition proved to be one of small submucous myoma; I regretted the mistake in diagnosis and that I did not postpone operation until the patient had recuperated, also that I did not do a subtotal hysterectomy or a total hysterectomy by my method).

In the twenty cases of malignant disease of the body there was one post-operative death (embolism), 5%. Two patients are known to have died within two years. Seven (17.5%) are known to be well five years or over after operation, one after four years, two after three years, four after two years and two after one year. None of the others replied to letters.

In cancer of the body then it appears that the primary mortality rate is small and the prospect of permanent cure fairly good.

As my experience of total hysterectomy grew, I sought for a technique which would avoid its disadvantages. These are as you know longer time in performance, more bleeding, higher operative mortality, subsequent shortening of the vagina with occasionally prolapse.

I eventually evolved a procedure which I recommend to your notice. The details of the operation are fully described in *The American Journal of Obstetrics and Gynecology* (Volume LXXVI., No. 6, 1917). It consists of cutting inside the utero-sacral and cervico-pelvic ligaments and parametrium, then down through the musculature of the cervix, then out to include the whole of the everted diseased cervix, so that no gland-bearing tissue is allowed to remain, yet the keystone of the vaginal arch with the attachments of the endo-pelvic fascia and parametrium re-

mains unimpaired. The specimens shown will help to illustrate the procedure.

I did my first operation by my method on April 14, 1914, and have to date done three hundred and twelve similar operations for non-malignant conditions of the uterus with one death (0.3%); the last two hundred and twenty-nine have been consecutive recoveries. The death was due to intestinal obstruction at the end of the second week. My attention was not called to the patient until the day of her death, three days after onset of symptoms. *Post mortem* examination showed an angulation and torsion of the lower ileum due to a point of adhesion to the stump. The condition could have been easily relieved by re-opening the abdomen.

The operation was also performed seven times for bilateral pyo-salpinx with gonorrhoeal endocervitis and five times to facilitate the enucleation of intra-ligamentary ovarian cysts and once to control the hæmorrhage and remove the damaged uterus in a broad ligament advanced pregnancy. All these patients recovered. It was also done in a case of puerperal infection which ended fatally.

In all the hysterectomies except those for cancer of the body the ovaries have been preserved. As a consequence menopause symptoms have been entirely absent or very slight and the patients have suffered no disability whatever. Many have expressed the greatest gratitude and satisfaction.

In only two have the preserved ovaries given any trouble; in one of these an abscess formed from an appendix adherent and infected and the other I had to remove for ovarian cyst development.

It may be confidently asserted that the end results of hysterectomy for non-malignant conditions, leaving the ovaries, are 99%, entirely and completely satisfactory.

Myomectomy.

In young women desirous of children myomectomy when possible is the operation of choice and its sphere has of late been much extended. During the past five years I have done this operation twenty-four times without a fatality; the secret of success is, I think, not to tie the hæmostatic sutures too tightly. The patient should be told that further development of the growths necessitating another operation is possible, even probable.

During the last five years I have found myomata associated with cancer of the body on four occasions.

In the same period there were six cases of serious degeneration, including three of red degeneration.

Infection of the tumour occurred twice, both these followed curettage; in one, the wife of a well-known politician, the whole tumour was gangrenous; after no end of trouble and two re-openings the patient recovered.

Adnexal disease with adhesions was present in about 30% of the cases.

Cancer of the Cervix.

In moving to new rooms some twenty of my records of Wertheim's operation were lost. These were my earlier cases. Speaking from memory there were five fatalities in this series.

I have notes of forty Wertheim's operations since then with three deaths (7.5%).

Of the thirty-five patients who survived the operation

one is known to have died within the first year, three within two years, three within three years and three within four years.

Two are known to have been well after one year, two after three years, three after four years, three after five years, two after six years, one after seven years and one after thirteen years.

Assuming that all those of whom no tidings could be gleaned, have died of a recurrence, which is unlikely, seven patients have a fair chance of cure and seven in all probability have been cured (17.5%).

No case operated upon could be said to have been in an early stage.

Operation was never refused if there seemed to be the slightest chance of success.

Those patients who died of the operation, had a relatively merciful ending.

Of the survivors I know only of one who probably was worse off than before. This was a young Russian in whom there was a recurrence or continuance of the disease and such rapid growth that colostomy for the relief of obstruction of the pelvic colon became necessary a few months after operation.

In two patients the recurrence took place in the rear of the vaginal vault; all the others in whom recurrence took place, were spared the factor of the discharges which renders the cancer victim abhorrent to herself and those around her.

Three had ureteral fistula following operation, one had vesical fistula from sloughing of the bladder wall off which growth had been resected; it would have been better to have resected the wall in this patient, as I did in two others in whom the bladder wall was similarly affected.

Both ureters were implanted after division into the bladder in one patient. The patient after recovering from an attack of pyelitis suffered no disability from the procedure. The pelvic glands were ostensibly enlarged in only three cases.

One patient was single, three were nulliparæ. The oldest patient was sixty-five years and the youngest thirty. The pathologist reported the growth to be adeno-carcinoma six times, cylindrical-celled carcinoma six times; all the others squamous celled. Two were typical papillary (cauliflower) growths; fifteen were entered as excavating (crater like). The papillary form is the most favourable and the boring (intra-cervical) carcinoma, the most insidious, difficult and dangerous.

The technique employed was Wertheim's, except that peritoneal gauze drainage into the vagina was used instead of the subperitoneal advocated by him. The latter appeared to favour ureteral fistulæ.

Conclusions.

The conclusions based upon the foregoing experience are as follows.

Presuming the surgeon has made himself competent by assisting an expert over a prolonged period and in other ways, then the treatment of non-malignant neoplasms of the uterus by surgical means is sure and safe and gives end results entirely satisfactory; the patient is really cured.

The operation should always be total (rather than subtotal) hysterectomy, when the cervix is injured or dis-

eased. The method of performing total hysterectomy which I have indicated, is much superior to the ordinary technique.

It is unjustifiable to remove the ovaries unless grossly diseased. Curettage is dangerous in the presence of myomata.

For cancer of the body of the uterus complete hysterectomy by the ordinary technique is still the best treatment and gives fairly good prospects of cure.

In cancer of the cervix dogmatic statements as to the prospects from operation are as much out of place as they are when speaking of cancer in most other regions.

There is not a surgeon who would not gladly surrender whatever earnings he may derive from operations for cancer, if only it were made clear to him that a method of treatment had arrived which gave better end results than surgery could offer.

My experience and study impel me to regretfully say "this time is not yet." I have used all the radium in the Sydney Hospital and that belonging to Drs. McMurray and Langloh Johnson without being able to satisfy myself that the march of the disease had been materially delayed. During my medical career I have seen various treatments for cancer come and go. Only surgical methods have survived. Surgery does undoubtedly cure a considerable number, while a larger number are by surgical means restored for a time to life and hope.

By educating the people to apply immediately for treatment on the appearance of the first unnatural symptom or sign and by better technique our present results will surely improve.

Early Diagnosis.

Early diagnosis is the most essential of all factors in the cure of cancer. It is of such supreme importance that I think Congress should recommend the Federal and State Governments to give the widest publicity to medical views by inserting in the public press and by posting in every post office, railway station and police station throughout the Commonwealth, some such notice as this:

Cancer.

Curable in the early stages! Do not delay a moment in consulting a doctor if you have a lump or sore on or in any part of the body; or if you have stomach or bowel trouble or if there is any unnatural bleeding or discharge!

The medical profession must do its part. Any practitioner who treats a woman suffering from unnatural hæmorrhage or unnatural discharge without a careful examination, is recreant to his trust and the same applies to him or her who tells a patient complaining of bleeding that she is suffering from "change of life" when he knows or should know that unnatural bleeding at any period of life must be pathological and needs thorough investigation.

Technique.

Lately I have been planning a new technique based on the original researches of Professor Watson. I am hopeful this will enable the parametrium to be removed with less danger to the vascular supply of the ureter.

Unfortunately in Australia and in a lesser degree in Great Britain cancer patients are split up amongst many surgeons so that no one surgeon acquires a wide experi-

ence, such as is the rule in the great clinics of Vienna, Berlin and Paris.

War experience has shown that concentration of similar cases has greatly aided successful treatment.

That chronic irritation of any kind may excite the development of cancer is one of the few facts known about this dread disease, therefore the profession should be united and firm in advising that every lacerated cervix should be repaired and every erosion cured. Theoretically the long continued use of pessaries should be tabooed.

Finally, with regard to radiology, I cannot agree that it has any place in the treatment of non-malignant uterine neoplasms except when grave constitutional disease precludes operation. It is variable, uncertain, dangerous and even when remedying hæmorrhage does not leave the patient secure against degenerations, malignant change or even against recurrence of the hæmorrhage; in other words it does not cure. When radiology relieves, it does so by causing atrophy of the ovaries and thus disturbs the balance of the endocrine system. Its advocates say it is contra-indicated when fibroids are complicated by cancer, degenerations, inflammatory conditions of the appendages and neoplasms of these, but it is not possible with absolute certainty to exclude any of such complications prior to opening the abdomen and examining the specimen.

In cancer of the body radiology is inferior to complete hysterectomy.

In cancer of the cervix the judgement must be the same, but I should welcome proof that I am mistaken.

RADIO-THERAPY OF UTERINE TUMOURS.

By L. J. CLENDINNEN, M.B., B.S. (Melbourne),
Honorary Radiologist, Melbourne Hospital.

Radio-therapy covers treatment by X-rays and radium and these may be considered together, as the rays of each utilized in pelvic work are very similar, as also is the resultant biological action. While X-rays have been likened to a shot-gun in their effect, radium gamma rays of greater intensity but more localized have been compared to a bullet.

In practically all malignant growths the best results are obtained by a combination of the two and this holds true in uterine tumours. Radium, owing to its compactness and the anatomical advantages of close application, is the more important. X-rays, especially of hard filtered type, are a very valuable adjunct in covering a large field by radiation and in neutralizing the risk of radio-excitation of deep metastatic foci (which is apt to occur) owing to their distant situation from the radium, the rays of which diminish inversely as the square of the distance.

Biological Action.

The biological laws are still not understood, but definite changes are seen which are universally accepted. These may be divided into two classes: (i.) Changes in the abnormal cells themselves, (ii.) changes in the normal cells and structures.

Changes in Pathological Cells.

A sufficient dose of radiation in carcinoma of the cervix

will produce definite changes in the tumour cells. Immediate coagulation-necrosis is noticed in the vicinity of the radium. In the zone beyond this a swelling of the cell with a breaking up of the chromatin is seen on third day. This is followed by changes in the nuclear shape and loss of staining power. The cytoplasm is increased and shows vacuolation and later, after about eight weeks, these cells vanish. Other carcinomatous cells, apparently in a different stage of development, remain collected together in their original alveolar forms with no nuclear structure visible in a so-called "embalmed" state. These later on become encapsulated with fibrous tissue.

Changes in Tissues.

During the first week there is a general congestion with swelling of endothelium of blood vessels together with a marked lymphocytic exudation and a less number of polymorpho-nuclear leucocytes. Lymphocytes persist during the third week, when numbers of small round cells are found infiltrating the tumour cells, dividing them and surrounding them. These are young fibroblasts which become more conspicuous in the fourth week. At the same time the blood vessels which have shown swelling in all coats especially the intima, now are constricted and even in some cases the lumen is obliterated. At a later stage any malignant cells remaining are seen incarcerated in this fibrous stroma.

So the effect of radiation on malignant cells may be divided into two processes: (i.) The direct or destructive, (ii.) the indirect or starving. Radiologists are divided as to the ideal to be attempted. There are those who hold that every cancer cell can be killed by a radiation dose sufficiently large. This in a broad sense is the theory which originated in Germany and the lethal dose for a carcinoma cell was estimated at 90% to 110% of the skin-erythema dose. Accurate methods of physical measurements and charts are available, so that a uniform depth dose may be delivered in various parts of the body; but the effects of these deep irradiations are much complicated in the proximity of suprarenals, pancreas, spleen, liver and thyroid. The distance from these and a central position render the uterus the most favorable organ for the possibility of a nearly homogeneous radiation from external X-rays. At the same time this can be supplemented by a local dose of radium to complete the lethal or carcinoma dose which is stated to induce regularly a retrogression or a cure.

Other experienced radiologists hold this is not true in the majority of cases and prefer rather smaller frequent doses to eliminate the violent general reaction seen in these cases. They rely on a stimulating effect on the lymphocytes and in connective tissue to build up and encourage the natural defensive agencies in the body. In support of this wandering, destroyed cancer cells have been demonstrated in lymph glands.

Lymphocytes which are very radio-sensitive, and probably destroyed by each radiation, are thought to induce a change in the cancer cells by their liberated proteins, at the same time calling forth further reinforcements. Along with this a barrier is being constructed by fibrillation of newly formed cells and this with the diminished vascular

supply gradually strangles the invaders. Colour is lent to this theory by the often noticed rapid lighting up which follows an incision for bioscopy or incomplete surgical removal of an apparently quiescent nodule or growth reduced by radiation. Similarly the rapid recurrence of any incompletely removed growth which is quite out of proportion compared with previous rate of growth, would be accounted for by the interference with the natural defensive barriers, while the increased vascularity means increased activity, and often dissemination. On this account routine sections for bioscopy both before and after radiation are not advisable, although of high scientific value and interest.

Again, post-operative radiation in every case over the site of removal of a malignant growth is indicated. If properly measured it can do no harm and in the great majority of cases will materially aid in the destruction or incarceration of any cells left behind.

Value of Radio-Therapy.

Admittedly the value of radio-therapy is a very difficult factor to determine. This method is still in its early childhood. Each year sheds a little more light on the results in different types of tumours with the improved technique and at least a five year period must elapse before the comparison of results with those of surgery. Moreover, results of radiologists in general are mostly of consecutive cases, the large majority being referred on account of their surgical inoperability, while surgical statistics are from specially picked favourable cases. Comparison of these is manifestly unfair to radio-therapy.

Although apparent results from radio-therapy in operable cases quoted by most authorities are slightly more favourable than those obtained from surgery, very few of these have yet reached a five year limit and this period, although probably long enough to publish fairly correct results from surgery, is insufficient and should at least be doubled for accurate results from radio-therapy.

Cases may be classified as suggested by Schmitz (1) into five groups.

Group 1 or localized type in which the growth is clearly confined to the uterus.

Group 2 or borderline type with questionable involvement of contiguous tissues.

Group 3 or inoperable type where invasion to neighbouring tissues and regional glands can be demonstrated.

Group 4 or advanced type of the "frozen" pelvis type, cachexia or distant metastasis.

Group 5 or complicated type with coexisting grave constitutional disease, although growth may be limited to the uterus.

Schmitz claims 25% of cures in all cases in a series of over three hundred patients, 64% of cures in Group 1 and 2, and 17½% in Groups 3, 4 and 5. No time period, however, is mentioned. Clark and Keene report 24% of three hundred patients alive and symptomless after a period of from three to seven years.

Platau, of Nürnberg, reports 24% of three hundred and ten patients treated during the last ten years are still alive (2).

Of sixty-eight of these patients treated in last three years by a standardized method 88% are still alive.

Kustner, at Breslau, holds that every operable case should be treated surgically and treatment by radiation should be only supplementary and prophylactic (3).

Beutner, at Swiss Radium Institute at Geneva, concludes radium is supreme in inoperable cases, while in operable cases comparative merits are debatable, but while surgery has reached the limits of technical perfection, radiation is still in its infancy (4).

Burrows, of the Manchester Radium Institute, reports that 6% of patients with inoperable growths were alive and well after periods of three to four and a half years, while 30% were alive at end of one year; he states that apart from this the treatment by radium is well worth while for its wonderful powers of palliation alone.

During past two and a half years I have treated eighty-eight patients, twenty of whom had definite and often advanced recurrences after operation, while ten others were referred soon after operation, chiefly on account of doubtfully complete removal. There was not one tumour of the operable or borderline group. The average history of hæmorrhage in forty-two private patients was over seventeen months, associated in great majority of cases with advanced spread, severe anæmia and cachexia.

The almost immediate cessation of the hæmorrhage following local radium treatment, the lessening of the discharge, especially the foul odour which is so offensive to the patient and relatives alike, followed by the recession of the growth and ulcer, together with the cheerful general well feeling of the patient prompts me to say emphatically that radio-therapy stands alone in the palliative treatment of this class of case.

Months of comparative comfort are added to their lives, while occasionally a brilliantly responsive case surprises us.

As long as patients referred for treatment have growths of this advanced type, the numbers of ultimate good results will always remain low. I think it is indisputable that radiation is the method of choice in the cases comprising Groups 3 and 4. Also in the small Group 5 in which surgery is contra-indicated, no argument will be raised. Let us now consider the operable and borderline cases. It will be admitted that where surgery fails and a recurrence occurs, this recurrence is inevitably more rapid in growth than the original growth and surgery actually has done more harm than good.

Can radio-therapy do anything to minimize this harm? Can we by an intelligent cooperation of the two methods expect better results?

Firstly consider pre-operative radiation and see what we can expect of it.

Pre-Operative Radiation.

Radium, even if it does eradicate the local lesion and its action will be far more potent on this part, will not accomplish much as this portion will be removed *in toto*. The outlying cells which are likely to be spilt at operation may be only sickened for a time by radiation and these if carried away are not in the area radiated after operation. Therefore if pre-operative treatment is carried out, it must be

done thoroughly by the combined use of radium locally and deep X-rays externally, so that the whole pelvic area is included. Moreover, the closure of the lymphatics is probably very important. This, however, does not occur till about the third or fourth week. The sclerotic effect is not manifested till after the fourth week, so that the recognized time for operating after radiation is between the third and fourth week. This means a delay for the surgeon. In early localized cases this perhaps is not so important as in borderline cases and in the latter class in which there is possible extension to those parts that are likely to be traumatized, surgery is more liable to interfere with the sclerotic incarceration of cells there. This prompts some workers to go so far as to say that surgery is contra-indicated after radiation or in other words that pre-operative radiation is useless.

Post-Operative Radiation.

What can be promised of post-operative radiation? It is for the purpose of preventing recurrences or metastasis. Radium treatment after operation must be carefully carried out in the vaginal vault, the capacity of which is very limited. This together with adhesions much retards the ability to pack off the rectum and bladder. At the same time the effective uterine filter has gone, leaving only very thin structures separating the abdominal viscera from the radium. Combination of X-rays with radium is again most important in this class of case.

What is our aim in these cases? Is it to kill outright the remaining cancer cells or to hope to starve and strangle these by stimulating the natural defences? Here again is the divergence of opinion; the one school holding that anything less than a lethal dose will be of no use, while others quote cases in which post-operative full doses have proved disastrous and record much improved results with smaller more frequent doses to stimulate the normal tissues.

I venture to think both sides may be correct in a degree.

Personal experience cannot induce me to believe that all carcinoma cells will be definitely killed or will retrogress with a variation of 10% either side of a skin dose. In carcinoma of the breast the result of the treatment can be more closely watched and it has been apparent that various types of growths vary greatly in their response. We have become accustomed to treat these in different ways. A slow growing scirrhus cancer generally in an old woman apparently requires small repeated doses, while a larger dose is liable to produce an ulcer which remains intractable and very liable to septic infection. This is followed by a very rapid recurrence. Here the normal tissues must be stimulated and not destroyed and the lymphocytic reaction is probably a big factor in the result.

A vascular looking softer growth with a short history generally in a younger person, if treated in this way, will often be found either to fail to respond or possibly to increase its rate of growth and this type needs very energetic treatment at the risk of the normal tissues.

I predict that with more careful histological cooperation in future and perhaps varying the treatment according to the type of growth and with a better understanding of these biological laws with radiation there will be an improvement in results.

In the meantime very probably improvement in results

generally would accrue if the surgeon limited himself to growths definitely localized to the uterus, referring all others, including borderline tumours, for radio-therapy.

The value of pre-operative and post-operative radiation probably varies in different types of cases. If there is any doubt about the total eradication at operation, radio-therapy should follow. Radiation whenever used should be administered by a specialist. Treatment given by a general practitioner owning an X-ray apparatus or the hiring of radium and its use by the surgeon cannot be too strongly deprecated.

References.

- (1) Henry Schmitz, *The American Journal of Roentgenology*, 1920, Volume VII, page 383.
- (2) W. S. Flatau, *Zentralblatt für Gynäkologie*, May 12, 1923.
- (3) H. Küstner, *Deutsche Medizinische Wochenschrift*, December 8, 1922.
- (4) Beutner, *Schweizer Medizinische Wochenschrift*, February 1, 1923.
- (5) A. Burrows, *The Journal of Obstetrics and Gynaecology of the British Empire*, 1922, Volume XXIX., page 1.

DR. H. FLECKER brought forward the figures obtained by Schmitz in the treatment of malignant disease of the uterus by irradiation with X-rays and radium. Of twenty-five patients affected with inoperable and "border-line" carcinoma of the body of the uterus twelve were well after the lapse of five years. In a total of one hundred and nine subjects of cervical carcinoma twelve were well at the end of five years; in fourteen of these the disease was localized at the outset of treatment and six showed no signs of recurrence at the end of the five year period.

Schmitz further reported on sixteen patients who had been apparently cured and classified them as follows: operable 71.4%, "border-line" 54.5%, inoperable 27.9%, "terminal" 2.5% and "recurrence" 2.2%.

Tausig reported 95.5% of cures in patients treated by nine different men with radio-therapy. The total number was 1,099.

Béclère failed in seven out of 700 cases and hysterectomy revealed submucous fibroids in every case.

The speaker quoted Howard Kelly as having said that it was blessed foolishness to declare that a mutilating surgical operation, which removed the womb just for the sake of getting out some fibroid tumours encapsulated in it, was a satisfactory operation, while to stop the growth of the tumour and shrink it with radium was unsatisfactory.

Dr. Flecker further quoted Clark who had said that he had emphasized the fact that if they could get a 20% three year salvage in hopeless cases, they ought to do better than 33% in operable cases of very limited growths hitherto submitted to a very extensive panhysterectomy. In sarcoma of the uterus X-rays were of use in diagnosis; sarcomata rapidly disappeared under irradiation, fibroids more slowly. In Continental university hospitals every gynaecological clinic had its own X-ray equipment and personnel.

DR. CHAS. E. DENNIS said that he would confine his remarks almost entirely to the question of treatment of carcinoma of the cervix uteri by radium and X-rays. He would consider first treatment by radium alone and in the second place treatment by radium and X-rays in conjunction.

At the outset he wished to say that with one or two exceptions or in those instances in which treatment was

pre-operative, in all the patients treated by him the disease was not only inoperable but far advanced, so that he had considered the treatment as merely palliative.

In regard to several patients in an early stage of the disease in whom radium applications had been followed by pan-hysterectomy, the surgeon had stated that the cervical lesion had apparently healed, but unfortunately he found too late that the uterus had not been sent for microscopical examination. Of the ultimate history of these patients he could give no statistics. He had seen one of the patients a week previously and had found her free from recurrence after the lapse of three years. In one patient who had died after hysterectomy, the pathologist reported that there had been no sign of carcinoma, although a pathological diagnosis of carcinoma had been returned before treatment.

One patient in an early stage of the disease who had received two applications of radium and a course of X-rays to the abdomen, had been well two years later when he had last heard of her. In that instance the pathological report had been "carcinoma"; the uterus had been drawn to one side and fixed by the growth. Her condition had been described at the time as "doubtfully operable." Another woman in whom recurrence had occurred after operation, accompanied by urinary fistula and an abdominal sinus discharging pus, had been in a deplorable condition. She had been given two applications of radium and a course of X-rays to the abdomen and had been apparently well two years later.

In the majority of the patients treated by radium alone for inoperable growths the disease had been far advanced; often there was extension to the broad ligaments, vagina and bladder walls. Dr. Tait Sutherland had reported that one patient was well and clinically free from evidence of carcinoma over two years after she had received her course of treatment. In his opinion she had been quite inoperable. It was unfortunately his experience that when the cervical disease appeared cured, recurrence took place in the pelvis beyond the range of effective radium rays. However, with very few exceptions the results justified the treatment even when local relapse occurred. The results as a rule consisted in cessation of hæmorrhage soon after the radium applications, relief or mitigation of pain, diminution or cessation of discharge, loss of fœtor, improvement in health and gain in weight. Painful micturition and bladder irritability when present were often relieved and the patient's life was rendered comfortable for many months. In hospital work it was very difficult to persuade these patients to return early enough for a second application which should in his opinion be given two months after the first. With the cessation of symptoms they considered that they were well and often did not reply to the letters sent them. If the disease progressed after a second application, he found that no good usually followed further treatment. He believed that many of these patients would do well if they received a course of X-ray treatment after the radium applications in order to reach the broad ligaments with an effective dose by cross fire from within and without. He was very doubtful regarding the utility of abdominal applications of radium owing to the distance from the surface of the skin to the lesion.

In Dr. Dennis's opinion the best results would be obtained from combined X-ray and radium treatment rather than by deep therapy alone; less disturbance to the patient was involved. Radium applications were not followed by distress and after them such large doses of X-rays as were employed in the deep therapy technique were not necessary or advisable. At the same time it was necessary to observe great care in the technique lest over-action were obtained and rectal tenesmus were induced.

TREATMENT OF GONORRHOEA IN WOMEN.

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It is impossible to overestimate the general and wide spread evil effects of gonorrhœa in women and there is probably to-day no one disease treated by gynaecologists that gives rise to so much suffering and sorrow. Neisser, the discoverer of the gonococcus, gave the public some indication of its wide distribution when he stated that with the exception of measles, it is the most prevalent of all diseases. Most gynaecologists will admit that 80% of their work operative and medical can be put down to the ravages of this ubiquitous organism.

In the last report (1922) of the Royal Prince Alfred Hospital out of 1,512 specific infection diseases of all kinds including all forms of tuberculosis, 1,140 were venereal diseases, 672 of which were listed when he stated that with the exception of measles, it is the most prevalent of all diseases. Most gynaecologists will admit that 80% of their work operative and medical can be put down to the ravages of this ubiquitous organism.

Apart from the definite gonorrhœa and its secondary effects that come under our notice, there is much that never sees the light of day. For example, gonorrhœa in those women in whom the attack is limited to the area below the internal os and who suffer only mild symptoms, overlook it and never consult a physician. In addition there are those cases of chronic gonorrhœa in these localities which the average physician often fails to recognize altogether.

Thus we must acknowledge at the outset the unreliability of any statistics purporting to give the amount of gonorrhœa existent in any given community at any given period. All we can hope to do is to recognize in a general sort of way the waves of increase or decrease that periodically pass over communities.

However, with the introduction of the *Venereal Diseases Act* in New South Wales and its provisions for notification, we might hope to have in a few years some more reliable information regarding the incidence of this disease in our State. The Act passed in 1918 has been less than a year in force and it will take much intelligent handling to have its provisions effectively carried into practice. Our present Commissioner, who accomplished so much for the notification of tuberculosis when City Health Officer, can with confidence be left with the task. Still all practitioners should help by loyally conforming to its regulations as it is well designed both for the compilation of accurate statistics and for the prevention of this prevalent disease.

Waves of Increase.

It is well recognized that a definite wave commenced in New South Wales about 1908 due mainly to the suppression of all houses of assignation by an Act which dis-

tributed the prostitutes to every nook and corner of the city and led to a great increase in clandestine or amateur prostitution. This wave was further increased by the collection of young men in camps during the war and still further increased by their return from Europe bringing with them new and unaccustomed strains of gonococci which lost no time in showing what transplantation to new fields could accomplish.

The effects of gonorrhœa estimated in terms of premature death, workless days, sterility, abortion and cost of treatment represent an annual economic loss to the State that would exceed the wildest flights of our imaginations and it therefore behoves us as medical men to investigate gravely every avenue capable of diminishing and preventing the prevalence and ravages of this disease.

General Prophylaxis.

There is no disease to which the axiom that "prevention is better than cure" applies more forcibly than to gonorrhœa and there can be no doubt that of all methods of dealing with this complex problem education offers the best hope of ultimate success. How and by whom this education is to be imparted might be the subject of controversy, but all must agree that it is far better that the general lay public should be aware of the prevalence and seriousness of this disease than to continue to regard it as a mild complaint fit only to be the subject of coarse witticisms.

The war focussed attention on this disease and it can now fortunately be openly discussed without that degree of repulsion with which it formerly met. Much of the old atmosphere of studied secrecy has disappeared and we find many informative and decently clothed articles appearing in the lay press; in addition books, plays and cinematograph films are pressing on the public the seriousness and public menace of this and other venereal diseases. Medical men also have taken a fresh interest in their study and treatment and are to-day more competent to treat these complaints effectively than ever before. In addition many of the State authorities have introduced carefully compiled acts and regulations for dealing with venereal diseases and altogether the time seems ripe for the profession and those interested in sociological problems to unite their efforts with those of the commissioners responsible for carrying out these acts and launch a far reaching campaign of prophylaxis against this disease along educational lines.

It is a *sine qua non* that to have an enlightened public, we must first see that we have an enlightened profession and medical schools should therefore pay special attention to this part of their curricula and see that they send out their graduates well equipped for the campaign against venereal disease.

The Church should next be persuaded to assist actively and to learn from medical men the practical aspect of venereal disease, so that they might enlighten parents and guardians of the many complex problems surrounding sex hygiene. I can imagine no more fruitful cooperation between the Church and medicine than in this field of activity. I do not wish to deny that in the end it is really the moral education that matters, but feel that by cooperation many more would come under her influence.

The Church has recently shown the profession that she is not averse to help in the cure of disease, so why should she not take a more active part in the prevention of diseases, the end results of which form so large a part of the affections of applicants for relief at healing missions.

In the case of children approaching puberty, all must agree that it is far better that some knowledge of sex hygiene and the danger of illicit intercourse should be obtained from a reliable source than to depend on the present haphazard method of obtaining a scattered and distorted view from older children or even more harmful sources. And from what more reliable source can such information come than from the parent. Unfortunately, of late years all signs of parental control seem to be passing and we more often find that it is the child that can teach the parent. Most parents do not know how to go about instructing their children, because they themselves have never been instructed in these matters. It therefore, behoves the doctor, the clergyman and the schoolmaster to inform and assist the parent in this direction. I am strongly of the opinion that the parent should do the telling and should do it when puberty commences and I hold that little good, if not actual harm would come from classes of instruction to boys or girls.

A move in the right direction is a pamphlet authorized by the Bishops and General Synod of the Church of England in Australia and Tasmania, for the use of parents, guardians and teachers called: "Helps to Parents in Explaining Matters of Sex to the Young." No more useful book has been printed and many thanks have I received for recommending it to parents with children nearing puberty.

The State Health Department should employ paid and trained lecturers to address with the aid of lantern slides clergymen, teachers and parents on the dangers, prevalence and prevention of venereal disorders. This could be done through church clubs, teacher's colleges, Christian associations, business and labour unions and large industrial institutions. Pamphlets and the occasional tactful presentation of the subject in the public press would serve to further the general knowledge of parents and the lay public.

Other factors of importance in the prophylaxis of venereal disease are the age of consent which should not be too low, the advocacy of early marriage, and a demand for a marriage certificate of health. Swartz states that 70% of all women who come to New York hospitals for the treatment of venereal disease, are reputable married women who have been infected by their husbands. Neisser states that 75% of all men and 45% of all women have had gonorrhœa and that 30% have been infected by their husbands. We are all familiar with the frequency of the complaint of the woman just out of hospital that the operation gave her a discharge. The surgeon must heroically take the blame or otherwise cause domestic disaster. It would be impossible to estimate what percentage actually are infected on the first night, but the number is quite considerable and it is one more argument for the introduction of the too long delayed marriage certificate of health.

Alcohol especially in the young tends to break down the natural restraints and barriers and to cause forget-

fulness and disregard of the dangers of illicit intercourse and any campaign aimed at preventing venereal disease must take this aspect of the subject into serious consideration.

Amongst other important factors tending towards sexual impurity and therefore towards the propagation of venereal disease, Norris mentions the following: Inter-mingling of the sexes in industrial occupation, overcrowding, labour competition, faulty home environment, migration to cities, the advertising of unlicensed practitioners of medicine, ignorance and inadequate moral training.

Prostitution.

The arguments for and against the official recognition of prostitution have been prolonged and bitter and public sentiment in English speaking communities has always been against police regulation of this vice. Still cities like Paris, Vienna, Budapest, Berlin, Hamburg and Dresden would not persist in their efforts to control and legalise prostitution unless the authorities were convinced that some good resulted. In Paris the system has been in force for over sixty years and has been fairly efficient if we are to take as true Fournier's statistics which show that only 7.08% of infected men received their contamination from public prostitutes. On the other hand, that about 50% of recognized prostitutes in uncontrolled communities suffer from some form or other of venereal disease can hardly be doubted and any measures that will help to lessen this source of constant infection, cannot but be of advantage in the struggle against the spread of this scourge. All must recognize that it is Utopian to try and abolish prostitution altogether, so if registration makes it more easy to compel these distributors of disease to secure treatment and to refrain from plying their trade while sick and infective, it should be given a trial. Under registration inmates of a public hospital could be detained until such time as they are completely cured, whereas under existing conditions they often disappear and are with difficulty traced. The New South Wales Act provides penalties against the non-continuance of treatment, but in hospital practice it is extremely difficult to make this particular class of patient live up to the provisions of the Act, for as soon as they leave hospital, they must continue the practice of their profession in order to live.

Failing registration, I am of opinion that if brothels were licensed by municipal authorities at a high rate and all street canvassing strictly put down, many of the objectionable features of prostitution would disappear from the public gaze. The police would know their location and a strict check could be kept over their inmates. The white slave traffic and the harboring of minors both inmates and clients would be greatly reduced, if not eliminated; the sale of alcohol could be controlled and a system of medical supervision could be introduced, but the latter would not be necessary in practice, since it would be to the proprietor's advantage to house inmates who were free from disease. Further, the fact that the houses were well managed would tend to drive the clandestine prostitute out of business. As mentioned before when brothels were abolished in New South Wales about 1908, a wave of increase of venereal disease spread over Sydney. The women went in twos and threes to boarding houses

where they had neither the facilities for cleanliness nor the eagle eye of madame anxious for the reputation of her house. It further led to an enormous increase of the clandestine or amateur prostitutes, as many girls who formerly managed to live decently on their salaries or wages, were demoralized in these lodging houses by contact with women who seemed never to do any work, but still had the necessary money to parade a spurious appearance of luxury.

However tightly we might close our eyes, the prostitute has always existed, will always exist and will always be the greatest source of spread of venereal diseases, so in the consideration of this subject it is impossible to neglect this factor. I am strongly of opinion that registration for purposes of treatment and licensed houses for segregation will not augment licentiousness in the community, but decrease the public display of it and help to keep many women from indulging in part time prostitution as well as greatly reduce the incidence of disease.

Treatment.

Under this heading I shall deal with all those measures having to do with the control and treatment of infected persons, but before entering into details I desire to emphasize that there is only one way to decrease the prevalence of this disease in the community and that is completely to cure all patients, male and female, who present themselves for treatment of venereal disease. As the incidence of the disease is in a direct ratio to the number of uncured or half cured persons in the community, we as medical men must pay especial attention to the standards of cure in both male and female sufferers. The utmost importance must be attached to this aspect of the subject and until we have improved our tests of cure in those seeking advice, we have no right to criticize the methods of sociologists and legislators in their dealings with this question. I shall speak in more detail of these tests of cure as regards the female subject later.

I must now consider *seratim* the various factors tending to the prevention, treatment and cure of gonorrhoea in the female. First and foremost comes notification, attended with professional secrecy. The New South Wales Act provides for both with penalties. It is unnecessary to disclose the name of the patient even to the Commissioner and to do so to anyone else, lays the informer open to severe monetary punishment. Notification is absolutely necessary, so that we may gauge the problem to be grappled with and the fact that it should be secret speaks for itself. Still it will be some years before the public will be really convinced that the profession does not deal in personalities in regard to their afflictions. We must be at pains to convince them that we require these statistics purely with the object of combating the menace in the larger sense. Secondly comes the question of compulsory treatment. Our Act requires this under penalty as well as the continuation of treatment, but we all must recognize the hold that such a provision gives to unscrupulous and money seeking practitioners. However, with tact and the stimulation of public confidence in the uprightness of the profession in general, we should in time overcome any disabilities we suffer from the less ethical of our guild. Thirdly comes the increase of facilities for treatment and

this requires much money from our governments and much goodwill from the various organizations of public spirited gentlemen who interest themselves in this subject. The Government of New South Wales has made special grants for the establishment of dispensaries to treat ambulatory patients, and the success that has attended such clinics is well instanced at the Royal Prince Alfred Hospital where the attendance has been greater than can possibly be coped with. It has been found necessary to limit the number of applicants for treatment on several occasions. Such dispensaries should be open not only daily, but also in the evenings as many day workers are unable to attend except in the evenings. Further, the sexes should have separate days and evenings of attendance and the department should be divided into a number of small rooms, so as to lend itself to privacy and avoidance of all appearance of rush or crowd. The department at the Royal Prince Alfred Hospital dealing with 1,140 patients costs £2,000 *per annum*. These dispensaries should be more numerous and better provided with finance. The city should be divided into districts presided over by teams of medical men under the general supervision of the Commissioner appointed under the *Venerereal Diseases Act*. As a corollary to dispensaries ample indoor accommodation should be provided especially in the case of women who suffer more than men from peritonitic complications, as well as having the added difficulty of pregnancy to contend with. Furthermore, they comprise amongst them the greatest section of disease spreaders, namely the prostitutes. To cage these and detain them until they are no longer a potential source of infection would be a tremendous advance. To my mind it is the only failing of the New South Wales *Act* that a provision has not been incorporated whereby the venereally infected woman could be detained until cured. Only in the case of those "crimed" for other reasons can these women be prevented from mingling amongst the public before they are thoroughly cured.

Further, in connexion with the free dispensaries and hospital accommodation the most ample provision should be made for the carrying out of laboratory tests. The strain put upon the ordinary routine pathology work in a laboratory cannot be realized, unless the large increase in smear and blood work that the creation of a venereal department puts on the staff of a hospital not previously catering for this class of work *en masse* has actually been seen. Also we must recognize that if our standards of cure which depend mainly on pathology, are to be raised, ample staff and laboratory accommodation must be provided and all this costs much more money and imagination than has up to the present been provided in New South Wales.

Fourthly, an important part of dispensary and hospital as well as private practice is the warning of patients in regard to the contagiousness of their complaint. It is not generally recognized that most of those patients who continue to be chronically infected, are *pari passu* with treatment continuing to indulge in coitus whether domestic or private and it is only by talking in the strongest possible terms that such practice is likely to be discontinued. Pamphlets are of value in this respect and there are many excellent ones such as Rathburn's "Instructions" and those appearing in the Commissioner's booklet which will be of

considerable effect in supporting the medical man's curtain lecture. Under this heading comes also the question of marriage of gonorrhœics. There can be no two opinions about the villainy of any party contracting marriage under such circumstances. Unfortunately ignorance is often responsible for this crime which can only be overcome by the introduction of the marriage certificates of health and if as a Congress we can help to press upon legislators the urgency for the introduction of such a piece of legislation, we shall have at least saved many innocent victims from a lifetime of martyrdom. The importance of this aspect of the question under consideration is recognized by the framers of the New South Wales *Act* who have enacted a penalty for conveying this disease by marriage and encourage medical practitioners to inform the innocent party of the danger that is about to be offered to them in this otherwise desired and happy event.

As experienced practitioners we know how difficult it is to acquiesce in this recommendation which is provided with a penalty for failure not to do so.

In the fifth place the value of suppressing all quacks, patent medicine vendors, and advertising gentlemen of the *molasses* or *Chinese* herbalist type is so apparent as not to need comment.

The New South Wales *Act* wisely provides that no person other than a medical practitioner or a person acting under the direct instructions of a medical practitioner shall attend upon or prescribe for or supply any drug or medicine for the purpose of treating any person suffering from venereal disease. This provision which is accompanied by severe penalties prevents the chemist from becoming a venereal disease quack which was the order of the day prior to the *Act* coming into force.

In the sixth place personal prophylaxis in the female is not such an easy matter as in the male and is less likely to be practised by such women as expose themselves to the risk of contracting venereal disease. One cannot imagine the establishment of public prophylactic dépôts as has been suggested in the case of males. Still an anti-venereal toilet properly carried out by women possessing a knowledge of the anatomy and physiology of their genital organs would probably be just as effective as it is in the case of the male. Such a toilet should consist of: (i.) passing urine, (ii.) the thorough cleansing with soap and hot water of all the folds of external genitals, (iii.) an efficient antiseptic douche, (iv.) an "Argyrol" or "Protargol" vaginal suppository in the vault of the vagina and (v.) the smearing of the labia and vestibule with 30% calomel ointment, all to be carried out within twelve hours of running the risk of infection.

From personal observation of several early cases I am convinced that gonorrhœal infections of the female have their origin mostly in the cervix and that the urethra and vulva are secondarily involved by the infective discharge making its way to the outlet. Few men are likely to indulge in coitus during the stage of profuse discharge. It is either before they recognize that they are infected or when they think they are cured, and so it is in company with the semen that the gonococci find their way to the region of the cervix. In the cases observed the cervix showed acute vesicles on the *portio vaginalis* and reddening of the cervical mucosa at the *os externum* and it was only after several days had elapsed that the urethra and vulva

commenced to show signs of involvement. I feel sure that if patients came under observation early enough this would usually be the clinical picture of commencement and it is therefore to be expected that the douche, suppository or medicated tampon should meet with some measure of success as a prophylactic measure.

In the seventh place two principles govern the treatment of gonorrhoea in the acute stage. The diagnosis once established, every effort should be made to prevent its upward spread beyond the level of the internal os. It should be, as it were, confined to the downstairs apartments and refused admission to the first or second floors of the invaded home. The complete eradication of the infection by the destruction of the gonococcus in the involved areas must be attempted.

After ten years' experience of the treatment and management of the female Venereal Diseases Ward at the Royal Prince Alfred Hospital I wish to condemn strongly the many forms of local treatment indulged in during the acute stage of gonorrhoea. In the past far too much local treatment has been in vogue and I would urge that Nature be allowed to establish her own immunity which is the basic principle underlying the treatment of every infective inflammation. No matter what is done I feel convinced until the blood and body fluids have finished their battle with the gonococcal toxins, no improvement can be expected. I also feel that any future discovery of cure will come from a study of this aspect of the disease.

As for actual treatment, once the extent of the infection is determined, we should endeavour to confine the inflammation to the areas involved by local cleanliness and physical rest in bed and if this be not possible, at least confinement to bed two days before until two days after each menstruation; it is usually during this period that extension of the infection upwards occurs. When a patient presents herself for treatment she should be put to bed, the external genitals should be shaved (this is most important for thorough cleanliness to be maintained), the urinary output should be increased by copious drinking of water. Not until all of the acute symptoms have subsided should there be any direct application or injection made to the urethra. A restricted diet, all meat, spices and condiments should be excluded. Postural drainage of the genital tract should be employed. This can be accomplished by lying her on the abdomen or employing the Fowler position. By this means the discharge from the vault of the vagina is able to escape. Repeated vulva irrigations or sitz baths should be employed with mercury bichloride one in eight thousand, phenol one in forty, potassium permanganate one in eight thousand, "Flavine" or "Protargol" solution or a bland alkaline solution of bicarbonate of soda and borax a tablespoonful of each to two and a quarter litres of hot water. The vulva should be wiped with swabs soaked in 25% "Argyrol" solution one being left between the inflamed labia and a diaper being applied which should be frequently changed and made of very absorbable material. When much pain is experienced, Polak advises gauze soaked with aluminium acetate over which an ice bag is applied.

In the acute stage the vagina should not be douched, but we should depend on postural drainage and the above indicated local cleanliness to secure the removal of the

purulent discharge. If the patient is seen in the very early stages an attempt to abort the attack might be made by painting once the whole of the *portio vaginalis* and vulva with a 2% solution of silver nitrate in *spiritus aetheris nitrosi*. This is sometimes successful but only one attempt should be made. After each defaecation or urination the external genitals should be cleansed. No rectal examinations or enemata should be given for fear of infecting the rectum.

Individual immunity is very variable and some individuals seem so resistant to infection that they pass through the acute stage without any noticeable manifestations. However, most sooner or later reach the chronic stage which is characteristic of this disease when the causative organism seeks out the glandular recesses of the genital tract, finding resting places in Skene's glands, Bartholin's ducts, the crypts of the cervical mucosa and the underlying tissues. At this stage we must have recourse to anti-gonococcal applications and other measures to eradicate them from their hiding places.

Skene's glands can be treated by injections of "Argyrol" with blunt pointed hypodermic syringe or destroyed by injecting one or two drops of pure carbolic acid, the use of the cauter point or a diathermic needle or opening the duct.

Bartholin's glands can be injected, incised and the lining membrane destroyed by caustics or completely dissected out.

Vaginitis and the external inflammation of the *portio* and external *os* can be treated by medicated douche or painting the surfaces with 2% or 4% solution of silver nitrate which should be allowed to dry and then be covered by some medicated powder, bismuth starch and stearate of zinc or warm Fuller's earth. Tampons of 25% "Argyrol," 10% "Protargol" or picric acid combined with glycerine and accompanied by routine douching at low pressure can also be employed.

Once the infection has entered the cervical canal and glands very little of avail can be done. If it does not cause bleeding the canal may be first cleared of its thick mucoid discharge with a solution of bicarbonate and bichlorate (Dobell's solution) followed by judicious applications of 25% "Argyrol," 10% "Protargol," 1% to 2% solution of silver nitrate, iodine *et cetera*.

However, when once infection has entered the cervical canal, it invariably becomes chronic, causing hyperplasia and gland proliferation, even extension into the parametrium and utero-sacral ligaments, but if our treatment has not been too radical, the infection will remain downstairs below the internal *os* and gradually localize itself in the cervical tissues, causing cystic cervicitis, the treatment of which with its persistent leucorrhoea and menstrual derangement is practically hopeless, as you all are well aware. The only remedy for this chronic disease spreading affection is dissection out of the endometrial core as suggested by Sturmdorf or the destruction of the gland bearing area by the substitution of scar tissue by the application of diathermy, cautery or a pencil of radium within the cervical canal. It is claimed that the former treatment of Sturmdorf offers no bar to cervical dilatation in subsequent pregnancies, but the latter treatment has not been used long enough to say whether it does or not.

Gonorrhœa beyond the internal os or what might be termed upstairs infection, namely endometritis, salpingitis and pelvic peritonitis require in the acute stages no active interference only rest, postural drainage of the vaginal tract to get rid of discharge, ice bags to allay inflammation, anodynes for pain and enemata to relieve congestion. No local applications, no irrigation and no instrumentation are permissible. Rest in bed, efficient nursing and time for the patient to establish her own immunity are the only means at our disposal.

The treatment of the results of upstairs infection, chronic endometritis, "pus tubes" and pelvic peritonitis were fully dealt with in a previous paper on the treatment of pelvic inflammation delivered at the last Congress in Brisbane, but I would again like to offer a warning against curettage as a part of the treatment of chronic leucorrhœa. Until you are satisfied that the gonococcus is helpless by the establishment of a complete immunity on the part of the patient which only occurs three to six months after the onset of the disease, no instrument should pass the level of the internal os.

Finally how do we know when gonorrhœa is cured? What must be regarded as a sufficient standard of cure?

Three repeated microscopical examinations of smears conducted at considerable intervals should show the absence of the gonococcus, the absence of pyogenic organisms, the absence of pus cells in the locations most commonly affected, namely the urethra, Skene's glands, Bartholin's ducts and the cervical glands. These tests should be conducted immediately before or better the day after menstruation.

Evidence of the value of the complement fixation test has been accumulating recently. Schwartz and McNeil state that a reaction usually occurs about the fourth week and the reaction persists for seven or eight weeks after cure. Hence a failure on the part of the serum to fix complement in the case of a patient whose serum has previously reacted, is presumptive evidence of cure.

Sternberg asserts that diagnostic vaccination by subcutaneous infection of dead gonococci is of practical value. We all have seen the increase of cervical discharge that takes place after such injections and a certain value should be placed upon it in conjunction with the other tests.

In conclusion, I advise rest and cleanliness and as little local interference as possible, for when left to themselves not more than 10% of acute gonorrhœal infections extend beyond the level of the internal os.

DR. F. A. MAGUIRE spoke of the value of the complement fixation test in gonorrhœa. He held that it was necessary to employ a mixture of the different strains of organisms. It was of great help in diagnosis and in determining cure. Prophylaxis consisted of education and moral restraint. He had found that the best drug in the early acute stage was "Flavine" in concentrated solution (one in four thousand) applied by means of a sitz-bath, bathing or swabbing, but not for vaginal douches. It was non-irritant and a potent disinfectant. Diathermy to the cervix probably did more good in cervical infection.

DR. EDITH BARRETT said that education was most important. She had found in Melbourne that great improvement had taken place since this had been undertaken. The Society for Fighting Venereal Diseases aimed at getting gonorrhœa treated as a disease and not as a moral offence. They had to obtain cooperation with the women

themselves. At the Queen Victoria Hospital clinic they had not obtained good results in the treatment of gonorrhœa. The proportion of smears in which gonococci were found, was small. Many of the women had large condylomata and it had been found necessary to operate for their removal. At times there was great difficulty in diagnosis and also in determining when a person was cured.

DR. R. FOWLER spoke of the value of the complement fixation test. Its advantages were that it needed no preparatory directions to the patient. It could replace a genito-urinary examination. They could arrive at an earlier diagnosis than when they depended on the smear examination which was often indefinite. It could be used as a guide to treatment. Finally it could be made a quantitative test.

The disadvantages of the test were that it failed in some acute infections. A reaction was obtained more frequently when the infection was external to the uterus. In patients who had been treated with vaccine, a complement fixation was obtained four months after the treatment had been applied.

Turning his attention to diathermy treatment Dr. Fowler stated that the results at the Alfred Hospital had been favourable. They regarded it as a valuable weapon in the treatment of gonorrhœa. It was used to attack infection in Skene's follicles, Bartholin's cysts and the cervix. He demonstrated the apparatus used and described the method of its use.

DR. J. KENNEDY expressed the opinion that up to that time the outlook in gonorrhœa in women was hopeless, except when complete excision was adopted. The prospect had become more promising since the introduction of diathermy.

DR. W. T. CHENHALL saw many women in whom gonorrhœal infection was half cleared up by the treatment adopted. He wished to suggest the application of Bier's hyperæmia treatment.

DR. RALPH WORRALL urged the adoption of education especially of the young in the campaign against venereal disease. He also advocated prophylactic measures. He attached no importance to the ordinary examination of smears in diagnosis. He relied on the expression of pus from the urethra. He treated Skene's ducts by opening them and applying silver nitrate. Treatment of infection of the cervix by diathermy might, he feared, result in stenosis. He advocated the removal of the cervix by surgical means. This did not lead to stenosis nor to interference with pregnancy or labour.

DR. GLEN H. BURNELL spoke in favour of diathermy treatment for chronic endocervicitis. He considered it the best method that had been introduced. They had to be careful of the dose. The cervix should not be charred. Severe heat was not needed and the scars did not seem to contract.

DR. F. BROWN CRAIG was very pessimistic of cure of gonorrhœa in women. The gonococci lay hidden in the crypts and the infection was liable to recur in spite of all tests.

DR. FELIX MEYER drew attention to the frequency in which gonorrhœa occurring in young children was left untreated. The affection became chronic in these circumstances. He urged that all cases of leucorrhœa in children should be investigated and gonorrhœa excluded before treatment was begun. He agreed that it was very difficult to cure gonorrhœa in women in all its forms.

DR. T. G. WILSON referred to gonorrhœa in pregnant women in its subacute and chronic stages. He usually treated these infections with vaginal douches of lactic acid.

DR. T. W. LIPSCOMB would not agree that vaginal discharge in young children was always due to the gonococcus. charge in young children was always due to the gonococcus. At times acute vulvo-vaginitis occurred in young children and the smears from the discharge did not contain gonococci.

SOME OBSERVATIONS ON THE MANAGEMENT OF BREECH PRESENTATION.

By C. DUGUID, M.B., CH.B., F.R.F.P. et S. (Glasgow),
Adelaide.

It has been pointed out by the Executive of Congress that whenever possible precedence should be given to matters of prevention. It is in the spirit of preventive midwifery that these notes have been prepared. The principles enunciated have enabled me greatly to minimize mortality to the child and morbidity to the mother.

In the early years of my practice of obstetrics I was dissatisfied with results in breech presentations especially in primiparae. And yet, I seemed to be carrying out what I had learned as a student. Moreover, an investigation of the subject left me with the impression that many of the text-books advised too early interference, particularly with regard to bringing down a leg.

To me the chief consideration in the passage of a child presenting by the breech is thorough dilatation of the canal through which it has to pass. The greatest difficulty in the delivery is with the after-coming head which, it must be noted, has a greater diameter than the breech. Consequently any interference which lessens the bulk of the breech, diminishes the dilatation of the passage and necessarily makes delivery of the head more difficult. Bringing down a leg lessens the bulk of the breech and my contention is that whenever possible the legs should be left up. Moreover, bringing down a leg means bringing a part of the child in contact with the outside air, this in turn necessitating the application of hot towels. So long as the child is within the maternal parts, there is no fear of insufflation of mucus. Again, I think it will be admitted that when a leg is brought down, there is a tendency sooner or later to pull on it with the consequent result of extension of the head and upward displacement of the arms.

With these introductory observations I wish to pass on to prognosis. It will help us to keep the preventive aspect in the forefront. The mother is nearly as well off as in a vertex presentation with the exception that too early interference makes the case much more difficult and usually ends in laceration of the perineum and possibly of the cervix too. On the other hand, if no interference be permitted until the breech is born, my experience is that tearing of the perineum is even less common than in a vertex presentation and tearing of the cervix probably does not take place.

On the part of the child the dangers in breech presentation are certainly greater than in the vertex presentations and with the exception of early rupture of the membranes are nearly all attributable to delay in the delivery of the after-coming head, *exempli gratia* insufflation of mucus, pressure on the cord and injuries due to rapid artificial delivery, such as fracture of an arm or dislocation of the

neck. To indicate how this delay can be minimized is my reason for writing these notes.

Here I wish to distinguish between delay in the passing of the child as a whole and delay of the after-coming head and I would point out that delay of the former generally means ease in the delivery of the head.

Impaction of the breech is said to occur when the child is large or when the legs are extended and on the maternal side when the soft parts are rigid, when there is obstruction by tumour or when bony contraction of the pelvis is present. Pelvic contraction is not impaction and in any case should have been detected in the pre-natal examination. Rigidity of the soft parts nearly always yields to morphine and patience. The very slow passage of a large child is not impaction, but one must watch both the fetal and the maternal pulses. Marked abnormalities or monster conditions may cause actual impaction, as does full extension of the legs. These conditions, even if suspected, are probably never verified without deep anaesthesia, when whatever they are, they can be treated. The type of case which calls for the greatest judgement, is the more or less normal breech presentation, in which the progress is very slow in spite of good pains. If I decide that the child is not impacted, I do not interfere; if I decide it impacted, with the greatest care under deep anaesthesia I push up the breech somewhat and get down a leg, a procedure not as easy as it sounds, but quite possible. How then is one to decide when impaction is present?

The first indication to me is a rise in both the fetal and the maternal pulse rates. Later the fetal pulse slows and the maternal rise in pulse-rate is accompanied by a rise in temperature. A large *caput* forms and there is no advance with the pains. In 1918 I was called to a case of supposedly impacted breech. The pulses, maternal and fetal, were satisfactory, although the mother, a primipara, was worried and tired. The patient was said to be making no progress, but there was an appreciable although slight advance with each pain and no definite *caput* had formed. On questioning the students as to what should be done, everyone suggested pulling down a leg. On the contrary I stated why I was going to keep the legs up and in order to rest the patient I proceeded to give an anaesthetic, it being too late in the day for morphine and scopolamine. Examination confirmed my opinion that the *liquor amnii* was present in fair quantity. The patient slept for about twenty minutes and from that time onwards was given a whiff of chloroform with the pains which, however, did not become forceful. Consequently when close on two hours had elapsed, I gave one cubic centimetre of pituitrin, continuing the whiffs with the pains. In fifteen to twenty minutes the pains became strong and the buttocks were soon born and the legs guided over the vulva. The patient was then put on her back. The Moriceau-Smellie-Veit method coupled with pressure on the fundus and later on a rolled-up towel placed over the head caused the baby to be born without delay. There was no tear of the perineum nor of the cervix; laceration of the former would almost certainly have happened in this case had I brought down a leg.

I shall now briefly indicate the management of breech presentation which has given me improved results concentrating on the normal rather than on the abnormal type of case.

All primiparæ are examined three weeks before labour is expected, so that I know that the breech is presenting. A vaginal as well as an abdominal examination is carried out to satisfy myself as to the passage. The nurse in charge is then given instructions to have the room warm, to have ready an extra supply of hot water and a sufficiency of small hand towels and to put the patient to bed as soon as labour sets in. I find it quite necessary to safeguard the membranes from the very beginning remembering that good dilatation is an essential for the safe termination of the labour. When labour becomes definitely established, I give 0.015 gramme (a quarter of a grain) of morphine and 0.16 milligramme (one hundredth of a grain) of scopolamine; the latter is repeated in doses of 0.13 milligramme (1/450 grain) as ordered. Only if the membranes rupture do I examine vaginally to see if the cord is down. If it is still up and the pains are bringing the breech up against the *os uteri*, I still leave the patient alone. Forceps are boiled lest they should be required which is seldom. But what I do use very often is a small hand-towel rolled up and tied into a ball, the bulk of which is somewhat less than that of the hand. Pressure over the fundus ceases to give benefit once the head has entered the lower uterine segment. Direct pressure on the head is then necessary to aid further expulsion, but if supra-pubic pressure is to be kept up to the end with benefit, something which will sink deeper into the pelvis than the shut hand is required. This something is the soft towel-ball. It is placed close to the *symphysis pubis* and the assistant or nurse places her clenched fist on it and exerts pressure downwards. The effect, I think, is undoubtedly to increase flexion. It certainly aids very greatly in the final delivery of the after-coming head.

In the ordinary case my custom is to have the patient in the left lateral position and to commence the anæsthesia when the buttocks are on the perineum, to maintain it lightly until the buttocks are about to be born, allowing the breech to bulge the perineum with each pain. The perineum gets the same attention as in a vertex presentation and an indication as to how slow the normal progress of a breech is can now be gauged by noting how much of the buttocks is driven onwards with each pain. It is a mere line and the succession of lines made by the taut perineal edge impresses one more forcibly than anything else that Nature is in no hurry.

From this stage onwards a nurse controls the fundus. When an anæsthetic is being given, careful following up of the fundus, I believe, helps in keeping the arms in their natural position of flexion. The posterior buttock is carefully guided over the perineum. The legs are then received; they are not allowed to flop out. If they seem disinclined to come, pressure on the fundus is first tried, but if necessary this is combined with steady traction in the groin, anterior and then posterior, the traction being done by two fingers.

The patient is then placed on her back. If the pressure on the fundus is being maintained, controlled rather than actively exerted, the body will follow quickly and then the folded arms. Just before the arms come, I feel the cord. The baby is now put astride the left arm and the forefinger inserted well into its mouth. At the same time the fingers of right hand hook over the shoulders of

child. But it must be remembered that a trained hand must follow up the retreat of the child from above all the time. It is then time to exert pressure on the head itself, first with the shut hand and then with the towel ball. This is not a procedure in itself, but must be *pari passu* with the pull on the child's mouth and shoulders. When the occiput hitches against the pubic arch in addition to pulling the body and shoulders of child should be lifted upwards and forwards and the after-coming head is born.

When thorough dilatation of the passages has taken place it is surprising how easily the head is delivered. To me it is of paramount importance in the management of a breech presentation that the minimum of interference should take place.

FIBROID TUMOURS COMPLICATING PREGNANCY.

By EDWARD R. WHITE, M.D.,

Honorary Assistant Surgeon, Women's Hospital,
Melbourne.

Fibroid tumours of the uterus are a common experience in our work.

W. J. Mayo, of Rochester, estimates that 12% of women, fifty years of age, have myomata, but only a small proportion have symptoms.

With regard to fibroid tumours complicating pregnancy Schauta had eighty-six cases of fibroids in 111,112 pregnant women, Pozzi had eighty-three cases in 12,050 pregnant women and Pinard had eighty-four in 13,915 pregnant women or 0.6%.

Labour was spontaneous in fifty-four, but operative treatment was necessary in thirty.

In the Women's Hospital, Melbourne, for the past ten months, there were eight patients with fibroids among 2,400 pregnant women or 0.3%. In this series there was one death from *post partum* hæmorrhage (this patient was admitted moribund); there were two miscarriages. There was also one obstruction to labour; after several attempts at delivery by forceps "outside," this patient was admitted into hospital with a dead fœtus, with overlapping of sutures indicating an obstruction. She was delivered by perforation and craniotomy. There were one "tedious labour" in a multipara, one case of eclampsia, with difficulty in podalic version, due to a myoma, one case with a short, unaccountable, febrile course during the puerperium and one case of breech presentation with a normal delivery.

In our own private practice of the last hundred obstetrical cases, nine were complicated by myomata, which required special treatment. Although the majority of pregnant women with fibroids go to and through labour without difficulty, yet the object of this paper is to emphasize the need of watchfulness and careful attention to such cases.

In the treatment of this complication there are commonly two extremes. On the one hand there is an inclination to leave the case to Nature, a wise principle in the general practice of obstetrics, that is often forgotten! On the other hand, there is a keen desire, the surgical spirit of the age, to remove the tumour or the pregnant uterus.

Between these extremes a middle course should be steered. Delivery by the normal forces will generally occur; yet in every case during pregnancy, labour and the puerperium a close supervision should be made, with a readiness to interfere actively if such indications should arise, as pain, bleeding or fever, which do not subside readily and promptly with rest in bed.

Influence of Fibroids on Pregnancy.

Abortion is one of the commonest results and sterility is frequently associated with myomata. The average proportion of sterility in all women is 12% to 15%, whilst in myomatous women it is 30%.

Frequency of Malpresentation.

Even though the tumour by its size or situation does not interfere with labour, yet it frequently causes a malpresentation. Olshausen collected all reported cases and found vertex presentations in 53%, breech 24%, transverse 19%. Two of my cases and one at the Women's Hospital were breech births.

Case 1. A primipara, *aetatis* thirty-five years, was at full term, indefinitely in labour for forty-eight hours. We were called in consultation to a private hospital. A very large fundal fibroid was felt; there was a breech presentation. The *os uteri* was one-third dilated. Under general anaesthesia, the cervix was dilated and a living child weighing 3.2 kilograms (eight pounds) was delivered with difficulty. The placenta was delivered normally. A huge fibroid, lying posteriorly to the fundus, was more easily palpated.

Case 2. From a primipara, *aetatis* thirty-seven, a huge fibroid had been removed eighteen months ago; small myomata had probably been felt. In the last month of pregnancy a toxæmia developed, so labour was induced by bougies. There was a breech presentation. She became acutely eclamptic. Delivery of a still-born foetus was effected with difficulty. The third stage was also difficult. The uterus was then felt to be unusually large and nodular.

Obstruction in Labour.

Obstruction to labour by a fibroid is not very common. The reason is that, unless the tumour is low in the uterine wall or is pedunculated, allowing it to fall into Douglas's pouch, it is raised up out of the pelvis, when the uterus rises and so does not obstruct delivery. Moreover, myomata take part in the softening and succulency of pregnancy and so can be moulded and flattened out, which largely account for so many natural deliveries. This is well shown in Case 3.

Case 3. A parous woman, aged thirty-nine years, was five months pregnant with her third child. A small fibroid the size of a hen's egg was felt through the vagina on the right side of the body of the uterus and a smaller one in the cervix. At term she went into a private hospital with everything ready for a Cesarean section, if necessary. Labour was short, easy and normal.

On the other hand in a patient at the Women's Hospital with obstruction due to multiple myomata, a more careful observation of this patient "outside" hospital might have helped to obtain a living child.

A pedunculated fibroid in Douglas's pouch will certainly give trouble during labour and also a fibroid of the cervix, unless small (as in Case 3).

Case 4. A primipara, *aetatis* thirty years, was sent to us for an opinion at the sixth month of pregnancy be-

cause there was a large mass in the left iliac region. This was a pedunculated fibroid, riding well away from the brim. She was allowed to go on to term and her doctor reported a delivery by low forceps. That tumour should now be removed.

Fibroids Enlarge with Pregnancy.

During pregnancy myomata not noticed before take part in the general succulence and hypertrophy of the uterine muscle, enlarge and are discovered.

On the other hand during the puerperium myomata usually undergo involution with the rest of the uterus and may apparently disappear. This is well shown in Case 5 a tri-parous woman, aged thirty-eight, who had a normal delivery at term; whilst awaiting the completion of the third stage, a myoma, as large as an orange, was discovered on the posterior surface of the uterus. Six months later, that same fibroid could be detected with difficulty on bimanual examination. This involution was even better shown in Case 3, where no sign of the fundal nor cervical tumours could be found six months later.

Abortion and Fibroids.

Abortion is common, particularly in the submucous type. There were two cases in the Women's Hospital series and one in private.

Case 6. A primipara, aged thirty-three years, was two months pregnant, she had severe colic pains for two days; there was no bleeding. A fibroid was felt low in the uterine body. This was a case of threatened abortion, due to the fibroid. As she was anxious to carry, myomectomy was performed and an interstitial myoma 7.5 x 3.75 centimetres (3 x 1½ inches) was shelled out from the lower uterine segment, after pushing down the peritoneal reflection from the bladder. The patient was well narcotized for three days, made an uneventful recovery and went on to term, when we delivered her by low forceps.

It is well to note here the importance of the free use of morphine, which undoubtedly will lower the percentage of abortions following on myomectomy.

Fibroids and Rupture of the Uterus.

Fortunately our experience of rupture of the uterus is very small. It is quite possible that in so called spontaneous rupture of the uterus a myoma hidden in the lower uterine segment, may so weaken the wall that during the strain of an ordinary labour rupture may occur.

Retained Placenta and Post Partum Haemorrhage.

During the third stage hæmorrhage is common, owing to the distortion of the uterus preventing shrinkage and closure of the placental site. This is shown in one case of the Women's Hospital series and in the following.

Case 7. A multiparous woman, aged thirty-six, had a small fundal myoma. We confined her in her third and fourth labours. She had not had a *post partum* hæmorrhage in her third labour, but in the fourth delivery a few weeks ago, there was a fairly free *post partum* bleeding.

Retention of placenta occurred in Case 9. We shall mention this case later. The third stage was also difficult in Case 2.

Necrosis and Infection during the Puerperium.

The blood supply of fibroids during pregnancy is usually diminished and this constitutes a serious danger, for it may result in necrosis of the tumour and subsequent

infection. Injury and traumatism during labour may also cause this trouble. Here it is wise to wait and see if immunity be established before taking action.

Case 8. A primipara, *aetatis* thirty-four years, had a myoma the size of an orange situated on left side of uterus low down. Delivery was effected by low forceps. Three days later the patient had pyrexia which lasted for five days and a very tender thickening was felt over the tumour. The lochia was normal; on vaginal examination nothing abnormal was detected. She then made a normal convalescence. This was probably a commencing necrosis and infection of the tumour.

The same explanation would account for the obscure fever in a patient of the Women's Hospital series.

Fibroids and Radium.

We had one successful and very interesting case, already mentioned as being complicated with retained placenta.

Case 9. A primipara, *aetatis* thirty, had been married one year. She had miscarried at five months. I was then called by her doctor and with great difficulty removed the retained placenta piecemeal. There was a huge myoma reaching to the umbilicus on the right side of uterus, another, the size of an egg, just above the *os uteri* and bulging through the vagina and a third and smaller fibroid in the posterior wall of cervix, also felt through the vagina. Her convalescence was normal. She was not anxious for an operation, but was very hopeful of carrying again. Three weeks later a very mild dose of radium, lent to us by Dr. H. Lawrence, was applied. The abdominal tumour now measured 14.5 centimetres by 11.25 centimetres (5 7/8 inches by 4 1/2 inches). In three months a second irradiation was given. The tumour now measured 10 centimetres by 5.3 centimetres (4 inches by 2 1/8 inches). Her periods were regular throughout. Two months later she again conceived and carried to term with an easy labour. The placenta had again to be removed manually.

This was a case of large multiple myomata of the cervix and body of the uterus, which caused a miscarriage at five months; mild applications of radium were then given twice, without cessation nor diminution of the menstrual flow. Definite and rapid shrinkage of both fundal and cervical tumours occurred. Pregnancy followed soon afterwards, with a natural delivery at term.

Diagnosis.

It is generally easy enough to detect a pelvic tumour on bimanual examination, when it is large enough to delay or obstruct labour. But it is often difficult to determine the nature of the tumour. If it is in Douglas's pouch it is most probably: (i.) an ovarian cyst, (ii.) a fibroid or (iii.) a dermoid. If it is a fibroid, there are others generally palpable. If the patient is under thirty, it is generally an ovarian cyst. The average age of my patients was thirty-five.

Treatment.

1. Conservative treatment of fibroids during pregnancy is recommended, because it is astonishing what the natural forces can accomplish during labour. Case (3) and Case (9) are typical examples of multiple, fundal and cervical myomata, followed by normal labours.

2. During pregnancy if the tumour must cause obstruction, an operation is, of course, necessary. Unless there are evident pressure symptoms, as pain, or signs of tumour degeneration, as fever, or pain and bleeding, as in

threatened abortion, an operation should be delayed so as to obtain a living child. This is most important because, owing to the mother's age, this may be her only pregnancy.

3. Before or at the beginning of labour, try to push the tumour gently above the brim, aided by Sims's or the knee-chest position and thus to allow the presenting part to descend into the pelvis, when a natural delivery will occur.

4. At term remove the child by Cæsarean section and then deal with the tumour.

5. In some cases it is better to wait and allow labour to dilate the cervix sufficiently to permit of an easy forceps delivery, as soon as the tumour has been removed by operation (myomectomy). This is safe only in (a) cases where the dilatation is rapid, (b) in multipara, with previously easy childbirths and (c) when vaginal examination has been avoided. This method is probably safer for the mother than Cæsarean section. If there is a large tumour definitely causing obstruction, give the patient the alternative of immediate myomectomy, with the risk of abortion or Cæsarean section and myomectomy at term.

In Mayo's series, 504 women who had undergone myomectomy (two-thirds of whom were married) were traced. Twenty-four have had one child since operation, seven have had two or more since operation, with altogether forty-three living children. In addition fifteen were pregnant at the time of the investigation. Surely a strong argument for conservative surgery! Case (6) illustrates this point.

Summary.

1. Fibroids and pregnancy are not infrequently associated.

2. As the patients are usually delivered normally, a careful observation throughout is all that is necessary.

3. Pain and fever and bleeding, suggestive of tumour degeneration and abortion, indicate operative interference, unless these signs readily and promptly subside with rest in bed.

4. It is wiser on account of the patient's late child-bearing age to perform myomectomy and risk an abortion, than to interrupt what might subsequently prove to be her only pregnancy. Myomectomy followed by three days' narcosis, will greatly lessen the risk of abortion.

5. If the tumour is situated in the lower uterine segment and so may obstruct delivery, operative interference is indicated if that tumour does not lift up above the brim during labour.

A PRELIMINARY NOTE OF AN APPARENT 'SYNERGIC ACTION BETWEEN ERGOT AND STRYCHNINE.

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ON several occasions I have noticed clinically that in cases of *post partum* hæmorrhage the human uterus did not respond to oral or even hypodermic administration of ergot by contracting but rather by relaxing.

I have found, also, quite empirically that strychnine ad-

ministered hypodermically in these cases in a dose of 0.0033 gramme to 0.0022 gramme (1/20 grain to 1/30 grain converted a relaxing or inactive effect of ergot into a contractile effect.

I also noticed in a few cases where pituitary extract had failed to evoke a response in the third stage of labour that the injection of strychnine determined the contraction of the uterus.

It was therefore decided to investigate the question experimentally.

Liquid extract of ergot (British Pharmacopœia) and strychnine sulphate were the drugs used.

Experimental Results.

Reference to Figure I. shows that after injection of five cubic centimetres of liquid extract of ergot a contraction was obtained commencing twenty-seven seconds after injection, reaching maximum in seventy seconds, ending four hundred and twenty-five seconds after injection.

FIGURE I.

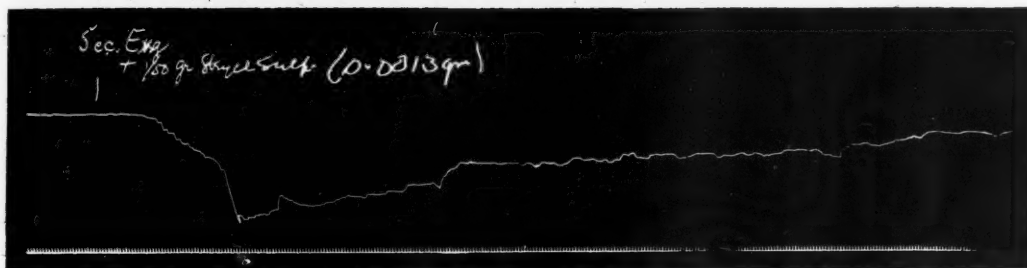
A

A. Injection of
5 c.c. Ext.
Ergot. Liq.



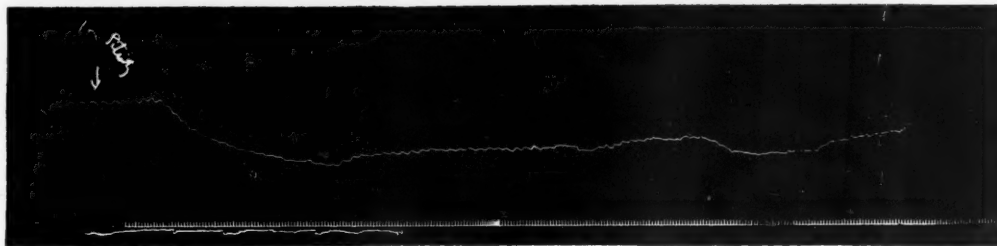
B

B. Injection of
5 c.c. Ext.
Ergot. Liq.
Strychnine
Sulph. gr.
1/50 (0.0013
gm.).



C

C. Injection of
1 c.c. Pituitary
Extract.



Experimental.

Young adult female dogs were in all cases used. A dose of 0.25 gramme of morphine sulphate was in all cases administered hypodermically about half an hour before the beginning of the experiment and the animal kept under chloroform throughout the whole experiment. In cases in which the dorso-lumbar cord was destroyed, a laminectomy was performed in the mid-dorsal region and the animal "pithed" with a lead rod which was left *in situ*. Injections were all given intravenously by a cannula introduced into the external jugular vein. The uterus was tied at the ovarian end and stripped up, the vascular supply remaining intact. The tied end of the uterus was connected with a writing lever, writing on moving smoked paper.

With an injection of five cubic centimetres of ergot and 0.0013 gramme of strychnine sulphate a contraction was obtained which commenced seventeen seconds after injection, reached maximum in fifty seconds and ended one thousand and twenty-five seconds after injection and at its maximum was nearly double the height of the previous contraction. This is even more marked in Figure II.

With a pithed animal (see Figure III.) no recognizable difference was detected. In two later experiments mere transection of the cord in the mid-dorsal region gave no difference, but the point is at present being worked out.

Discussion of Results.

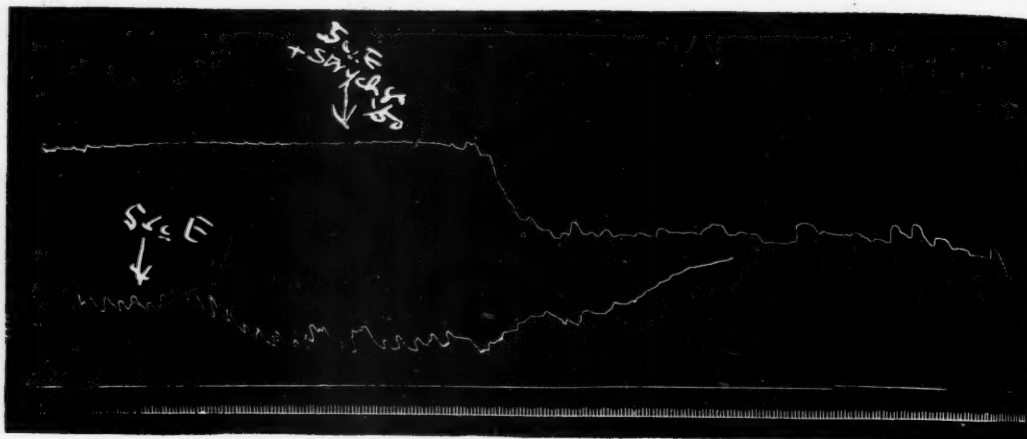
It is not proposed to here discuss the results at length, but it appears that the injection of strychnine will in-

crease the duration and strength of contractions of uterus evoked by ergot and that this result apparently depends on the integrity of the lumbo-sacral cord.

I desire to express my thanks to Professor W. A. Osborne for kindly placing his laboratories at my disposal.

FIGURE II.

Upper tracing.
—Injection 5
c.c. Ergot
Strychnine
Sulph. gr.
1/50 (0.0013
gm.).



NOTE.—In Figure II. the lower tracing is intended as a continuation of the upper tracing.

Lower tracing.
—Injection of
5 c.c. Ergot.

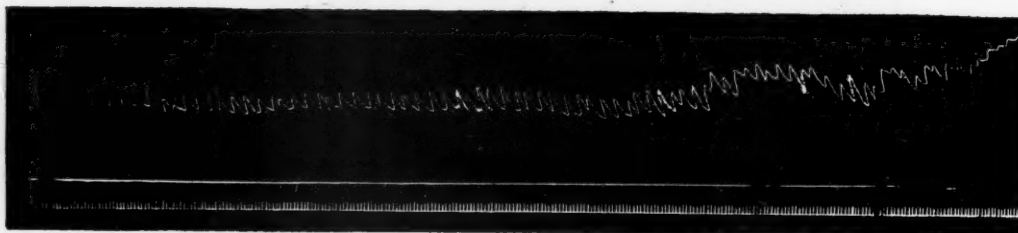
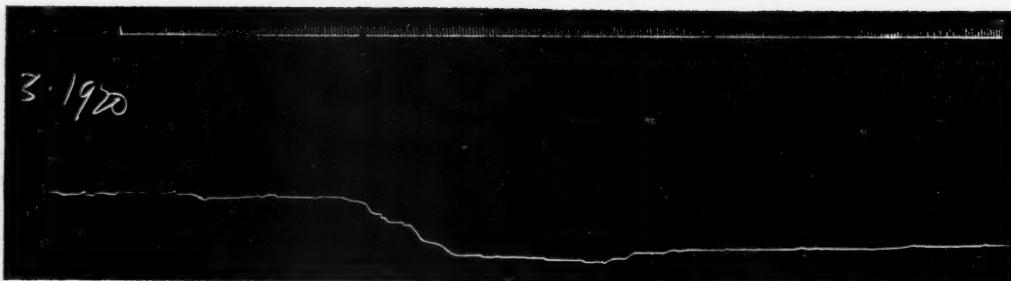


FIGURE III.

Upper tracing.
(A). — Injec-
tion 5 c.c.
Ergot in in-
tact animal.



Lower tracing.
(B). — Injec-
tion of 5 c.c.
Ergot Stry-
chnine Sulph.
gr. 1/50
(0.0013 gm.)
after destruc-
tion of spinal
cord from the
mid-dorsal re-
gion.

